

THE IRON AGE

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Carburizing Steels

CARBURIZING steels can be of either simple or alloy-steel grade, but are invariably within the low-carbon range. By the carburizing process parts are given a hard, wear-resisting, high-carbon surface, or case, yet retain their tough shock-resisting, low-carbon core. The commonest uses of carburizing steels are for gears, pinions and highly-stressed wearing machinery parts.

To obtain the desired combination of properties in carburized parts, the user has a choice not only of a number of different grades of steel but also of carburizing operations. In each case the service requirements must be balanced against the cost of the steel and also the cost of the treatment.

In general, it can be said of carburizing steels that the cores of carbon steels possess the least ductility, and that, of the alloy steels, the S.A.E. 2515 has the highest combination of core strength and ductility. The fine-grained (A.S.T.M. E1933) alloy steels, such as S.A.E. 3115 and S.A.E. 4615, have become more widely used because they have the property of producing good refinement and minimum distortion with a single quench.

For light parts or where extremely tough cores are required, the carbon content should preferably be 0.18 per cent maximum. For heavy parts with strong cores carbon content should be from 0.15 to 0.25 per cent.

The Society of Automotive Engineers in their



1935 Handbook give recommended treatments for all of the standard grades of carburizing steels, all of which Bethlehem produces.

When the double-quenching method is used, the first temperature is sufficiently high to refine the core and to dissolve the free carbides in the case, and the second temperature is lower for the purpose of refining the high-carbon case and also tempering the low-carbon core. A draw of 250 to 400 degrees Fahrenheit follows the final quenching operation to relieve the strains.

Carburizing materials are either solids, liquids, or gases; the solid materials being most generally used. The rate of carbon penetration depends on the carburizing agent used, the length of time, and the degree of temperature to which the part is exposed during the carburizing operation.

Service requirements determine the final depth of the hardened case. For most parts the carbon penetration must be sufficiently deep to allow for the removal of 0.10 to 0.15 inch of material by subsequent grinding. If the part is of such a shape that unusual warpage is likely to occur, this allowance must be increased.

The case must be sufficiently deep to provide uniform hardening without soft spots and to withstand the required amount of wear in service. Unnecessarily deep cases increase cost and susceptibility to breakage by severe shock.



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Bulls in China Shops

WOULD rather have a hard boss, who knew his business, than an easy one who did not. It would be easier to fool the latter, but when I did an exceptionally good piece of work, he would not be able to recognize the fact.

Nine out of ten workers in any line of industry feel the same way about this. And they are quick to appraise and appreciate ability of management or to detect and condemn the lack of it in the company that they work for. They know when there is a "bull in the china shop" because they see the damage that he causes. A new line of machines is designed for the market. They look fine on the blue print paper but when they reach the test block, they just won't work because the designer fell down in the practicalities of cause and effect. A company policy is established to promote good will between men and management, but it falls down because some one higher up lacks a knowledge of human nature. A promising sales campaign goes "haywire" because of a mistaken price policy.

Bulls in china shops. Good workmen do not like to see them because they know that enough of them will put their company out of business.

It would be well if we paid as much attention to sizing up public management under which we live as we do to appraising the private management under which we work. For there are bulls in public as well as private china shops.

What, for example, would you think of the wisdom of a manager who spent huge sums building a new factory on land to which he had no legal title and then had to pull it all down again and fire the help?

What would you think of the management of a concern doing an export business which fixed prices on a scale that permitted foreign competitors to capture the bulk of its legitimate markets?

What would you think of a company that controlled a store where employees were obliged to buy food and that boosted the price of necessities far beyond the range of the prevailing wages?

What would you think of the financial ability of a management that raised its rate of expenditures to twice its income and had no definite plan for bringing the two in balance again?

If you worked for such a company you would probably begin to look around to see where you might get a job after the bull finished the business. Unfortunately, you cannot do that when there is a bull in the public china shop. The one remedy is to get him out.

Because of the many requests for reprints of editorials appearing in THE IRON AGE, the publishers have arranged to make such reprints available in any quantity desired at a price representing cost of production and mailing. Please address Reader Service Department, THE IRON AGE.

Resistance Welding Extensively En

THE author describes various applications of resistance welding, emphasizing the trend toward automatic machines which he believes will be greatly accelerated in the future. The article is from a paper presented at a meeting of the production section of the Society of Automotive Engineers, held at Cleveland, Sept. 18, during the Machine Tool Show and Congress.

o o o



RESISTANCE welding first commanded attention of automotive executives about 10 years ago. Prior to that time it was employed only to a limited extent, and there was much skepticism regarding uniformity and strength of resistance welds. Engineers designing resistance welding machines have treated limitations of the process as problems of design and have solved these problems one by one in rapid succession, thereby increasing the application of electric resistance welding on a large scale from year to year. It was important during that time for manufacturers to do research and experimental work in the field of design in order that it might be possible and practical for various parts of both the chassis and body of automobiles to be adaptable to resistance welding methods.

There has been a noticeable trend toward the use of automatic machines, which have been found advantageous even in cases where production is not continuous. An important advantage of automatic operation is elimination of operator fatigue, thereby maintaining production at a high level with better satisfied operators. Other favorable results are more uniform welds, faster operation, better and smoother welds, lower current consumption and longer electrode life.

A test made in an automobile body plant between an automatic welder and a foot-operated machine showed that the former produced four times as many welds before point dressing was necessary, one-third greater production, and smoother, better, and more uniform welds. Savings were made in inspection, materials, and replacements on account of failures.

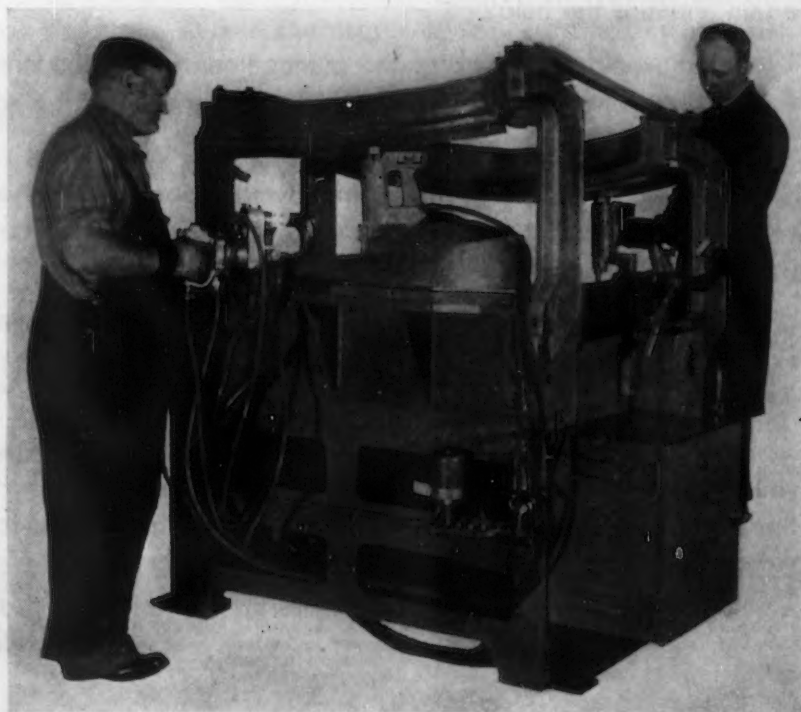
Types of resistance welding used in the automotive industry are:

1. Spot welding.
2. Flash butt welding.
3. Electrical upsetting.
4. Seam welding.
5. Projection welding.

On one of the more popular cars, the number of resistance welds on the body and chassis is 3240, consisting of 44 flash butt welds, 3194 spot welds, and two seam welds. In addition, there are numerous other welds made by parts manufacturers on accessories. A few years ago this car had a total of 1339 resistance welds.

Spot welding in the automotive industry is done on machines ranging from approximately 10 kva. to many hundred kva., and from one spot to several hundred during each cycle of the welder. It is generally utilized because of its simplicity, and can be employed wherever a lapped joint is possible. It can be applied by means of the following equipment:

1. Machines for making one spot at a time, the work being performed on a conventional type spot welder.
2. Machines consisting of fixtures in which the parts are assembled and welded one spot at a time, using bar, portable and gun welders.
3. Machines in which the parts are assembled and in which all spots are made at the same time by parallel electrodes.
4. So-called hydromatic welders where as many as several hundred spots are made during one cycle of the welding machine, but all spots



Employed in Automotive Industry

not necessarily being made at the same time, as is the case with the parallel multiple-spot welder.

As body stampings increased in size, it became more difficult to handle them on stationary welders. Welding fixtures were developed which clamp the stampings to be welded in the right position. The welding is then done by means of bar, portable or gun welders. With the bar type welder, the pressure on the point is usually produced by the operator. In the case of the portable or gun welder, the pressure is applied mechanically.

Another method of assembling large stampings is either by the parallel spot method or hydromatic method. In both cases the machine represents accurate and precision tool construction. Parts to be welded are inserted in the machines and clamped in position. In the parallel spot method, the machine contains one or more transformers. A number of electrodes are con-

By J. A. WEIGER

*Manager metallurgical division
P. R. Mallory & Co., Inc.*

• • •

nected in parallel to each transformer and pressure is made uniform throughout by spring adjustments.

When more than one transformer is used, best results are obtained by operating only part of the transformers at one time. Take, for example, a machine which produces 32 welds on a door. It consists of four transformers. Two diagonally opposite transformers first make 16 welds, after which the remaining two transformers complete the balance of the welds.

In the hydromatic type welder a multiplicity of hydro-electric welding guns are mounted in predetermined positions, being connected to a common bus-bar as well as to a common source of oil pressure. A highly efficient control mechanism

automatically operates the welding guns in rapid sequence. The small welding guns contact the work in the right position vertically, horizontally, or at any angle. Only one weld is made at one time from each transformer. For large jobs there are a number of transformers, each having its own group of welding guns. In this case several transformers work at the same time, each, however, only operating one welding gun at a time.

Body and Chassis Parts Flash Welded

Flash welding is utilized for welding the rear and side panels of the body, wheel rims and parts of the chassis, and has its special application where a smooth and invisible joint is required. The flash welding method of combining forgings, steel tubing and sheet metal is as foolproof as can be expected. Many parts of the chassis are flash welded. Some of these parts consist of forgings welded to tubes, in

AT LEFT

TYPE of fixture for welding body parts which illustrates two kinds of gun welders, one the C-clamp type and the other the expanding type.

• • •

AT RIGHT

CLOSE-UP of multiple parallel spot welder for welding doors. Machine contains four transformers and makes 32 welds during one cycle. Two diagonally opposite transformers produce 16 welds, after which and during the same machine cycle the remaining two transformers produce the additional 16 welds.





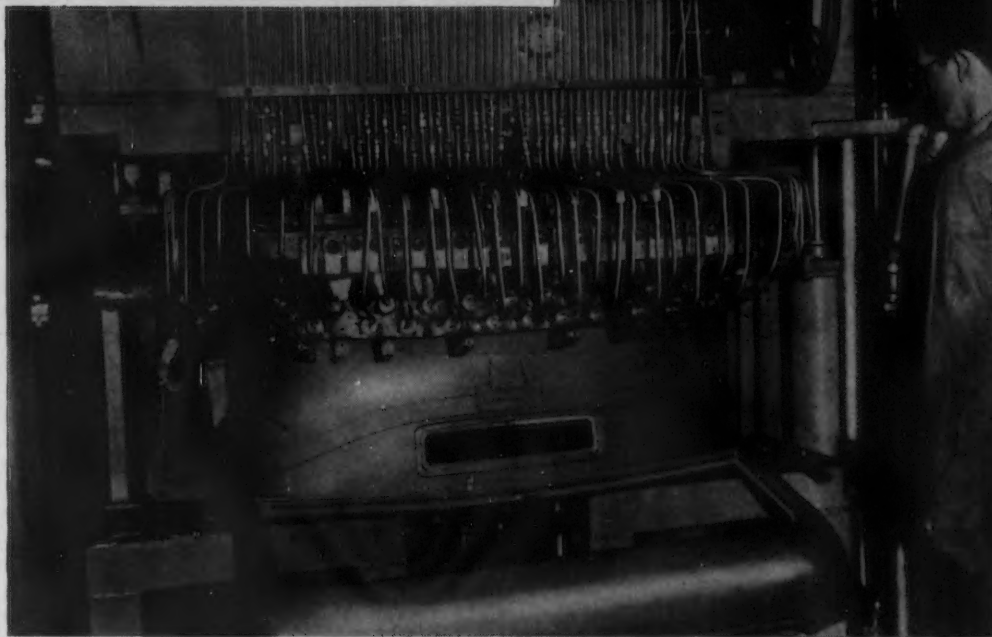
ABOVE

ANOTHER type of seam welder for use on gas tanks. The tank is fed automatically. Because of the automatic feeding attachment one operator can take care of a number of machines.

o o o

AT RIGHT

CLOSE-UP of hydromatic welding machine, showing details of valve control equipment.



which case the parts are fully machined before being welded. After the flash welding operation, the flash is removed by a trimming die and parts are ready for assembly into the car without further machining. This makes possible the machining of small pieces in small equipment instead of the handling of large castings with bulky and slow operating machines.

Electrical Upsetting

Electrical upsetting, which is not as common as some of the other types of resistance process, is used to advantage in assembly of roller bearings. One type of roller bearing is assembled by sliding the hardened and ground coils on shouldered spacing posts, which fit in countersunk end-rings. The reduced diameter of the spacing post extending through the countersunk hole in the end-ring is electrically upset, one end at a time.

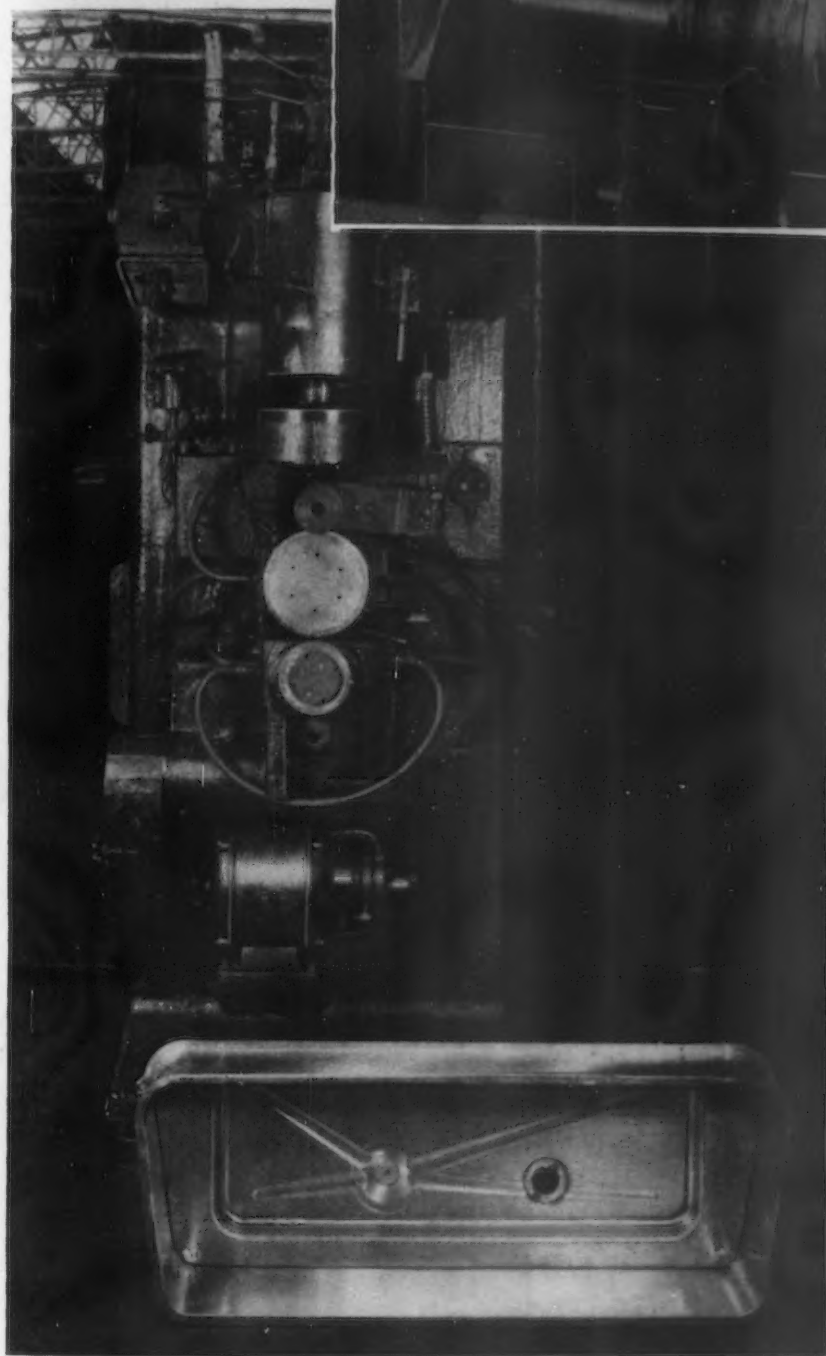
Tanks Seam Welded

Practically all gasoline tanks, which are made from terne plate, are produced by electric resistance seam welding. The baffles are spot welded in position, after which the tank proper is seam welded. This operation is performed by passing the lapped joints between two rolls which operate at a lineal speed of 6 to 10 ft. per min., and are so reg-

AT RIGHT

MACHINE for welding rear axle housing, with upper jaws open and welded housing in position. The light section on the dies is an Elkonite facing.

MACHINE used to seam weld gas tank (at bottom). Upper roll has a knurling wheel which automatically maintains the condition and size of the tread of the welding wheel.



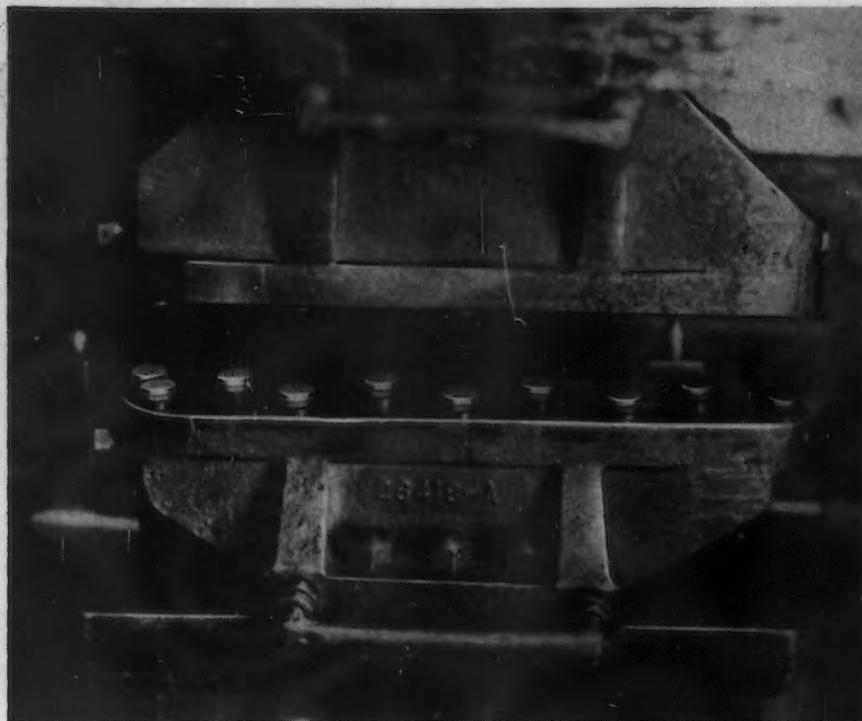
ulated that there is a series of spot welds, one overlapping the other, resulting in a perfect seal.

Projection Welding for Small Parts

Projection welding is utilized for joining small parts where more than one weld is necessary. Usually small projections, varying in size with the thickness of the material, are raised on one piece only, and the two pieces are then clamped between dies and all welds made at one time. Projection welding is limited by the capacity of the transformer and machine, and the design of parts to be welded. In projection welding the upper and lower dies are solid. When the parts are clamped between the dies, uniform pressure must be distributed over all the projections.

Welding Dies or Electrodes

The die or electrode material is one of the most essential parts of resistance welding machines. Originally copper was used, but it was soon found on many automatic machines to have too short a life to produce the desired results. For spot welding there are available today a number of alloys which have a life of three to 20 times that of copper. Experience indicates that for spot welding cold-rolled steel a high electrical conductivity is desirable and that the alloy used for spot welding tips should have a conductivity of at least 75 per cent



DIES used for projection welding the fender bracket. Copper lugs faced with copper tungsten (Elkonite) are force fitted in the water-cooled dies.

that of pure copper, and a hardness of 65 to 85 on the Rockwell B scale.

Correct pressure for spot welding cold-rolled steel is approximately 15,000 lb. per sq. in. of electrode area. As the tip mushrooms, the pressure and the current density decrease. After a certain time, poor welds will result. Many shops do not allow the machine operator to dress his own tips, but have tool men to replace tips, which then are re-machined off the machine. This gives an opportunity to have the tip made to the desired size and shape, and at the same time the proper pressure can be adjusted.

The tip material is even more important on multiple-spot welding machines, where as many as several hundred tips are used in the same machine. It can readily be seen that if tips are not uniform, much trouble will be encountered due to variations in current den-

ty, and a large percentage of bad welds will be made.

Water Cooling of Tips

Water cooling is necessary on all types of spot welding tips. Unless the tips are properly cooled, their life will be greatly reduced. Recently a thorough study was made of the proper water cooling of spot welding tips. A tip was made from stock $\frac{3}{8}$ in. in diameter and $1\frac{1}{2}$ in. long and having a hole 1 in. deep, leaving $\frac{1}{2}$ in. of metal from the bottom of the hole to the face of the tip. It was noticed that the first $\frac{1}{4}$ in. of the tip wore away rapidly, and that as the metal approached the water hole, more welds were obtained between redressings. Experiments with various depths of holes showed that a tip made with $\frac{1}{4}$ in. of solid metal from the bottom of the hole to the face of the tip was most economical. This tip

produced the same number of welds as the tip which had $\frac{1}{2}$ in. of solid metal between the bottom of the hole and the face of the tip. The result was economy in material, fewer redressings, more uniform welds, and more and better welds.

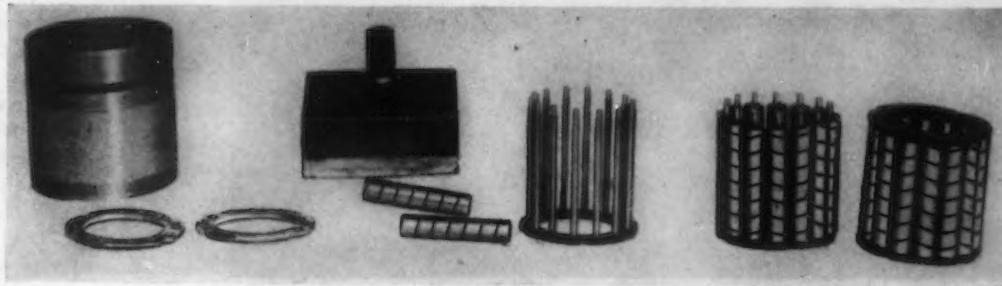
For seam welding wheels the same special alloys can be utilized as for spot welding tips. In order to obtain the most useful life from various alloys, it is essential that wheels be properly water cooled. The ideal way to do this is to spray water directly on the wheels and work being welded. This method is used to advantage by some manufacturers.

In projection welding it is essential to maintain parallel relations between the opposite faces of the dies. If the dies wear non-uniformly or if the projections produce cavities, non-uniform pressures and current densities will result, thereby producing non-uniform welds and a large number of unwelded sections. A copper-tungsten alloy known as Elkonite has been found satisfactory as a facing material for projection welding dies. Copper tungsten is used as a facing for plugs which are fitted in the water-cooled backing; if the projections are close, an entire facing approximately $\frac{1}{4}$ in. thick is recommended. The alloy can be readily silver brazed to the metal backing which has high conductivity.

For flash welding one must have a die material sufficiently hard to stand up under high pressure and at the same time possessing the necessary properties so that the flash produced during the welding will not stick unduly to the die material. To make long flash welds, such as the rear welds on bodies, special bronzes give satisfactory results. Short flash welds, such as on the rims of wheels, can be produced to advantage by facing the water-cooled die with copper tungsten.

(CONTINUED ON PAGE 102)

ROLLER bearing parts before and after being electrically upset. After welding, it is only necessary to have a slight hand grinding operation to smooth the end rings.



Cast Iron and Steel Differentiated

By A. L. NORBURY*



THE definition of the terms "cast iron" and "steel" has been the subject of a great deal of discussion. It has been discussed at international conferences, in the law courts and in numerous papers by metallurgists of all nationalities. The development of low-carbon alloyed cast irons has increased the need for some recognized dividing line. *The best method appears to be to fix this in terms of the presence or absence of eutectic.* Definitions of the terms in this manner, together with definitions of one or two other terms, are herein described as a basis for discussion. Some extracts from literature on the subject and a discussion of the limitations of some of the earlier definitions are also presented.

The suggested definitions are as follows:

Steels—Alloys of iron and carbon (other than malleable cast iron) with or without other elements, which do not contain carbide eutectic or graphite eutectic in the microstructure.

Cast Irons—Alloys of iron and carbon with or without other elements, which contain carbide eutectic (white cast iron) or graphite eutectic (gray cast iron) or both carbide eutectic and graphite eutectic (mottled cast iron) in the microstructure.

Malleable Cast Iron—The product obtained by eliminating the carbide eutectic from solid white cast iron by decarburization (whiteheart) or by conversion into graphite by annealing (blackheart).

*As published in the bulletin of the British Cast Iron Research Association.

Pig Iron—Pigs of cast iron from the blast furnace.

Refined Pig Iron—Pigs of cast iron whose chemical analysis and structure have been modified either before solidification from the blast furnace or by treatment involving remelting.

Semi-Steel—It is recommended that the use of the term "semi-steel" be abandoned.

With these definitions in mind, it is interesting to review extracts from literature of the past which deal with the terms "cast iron" and "steel."

From "An Introduction to the Study of Metallurgy," 1898, by W. C. Roberts-Austen, p. 41:

"In discussing the influence of foreign elements on iron, the terms 'cast iron,' 'wrought iron,' and 'steel' are used, as this classification is still in general use among engineers. In 1878, however, an international commission at Philadelphia decided to adopt a classification based on the amount of carbon contained in the metal:

"(a) **FIG IRON** with 2.3 per cent and more of carbon; melts at a comparatively low temperature (1075 deg. C. to 1275 deg. C.) and cannot be forged.

"(1) **White Pig Iron**—All the carbon is combined with the iron, the compound is very hard, brittle, white, and is made solely for the purpose of being converted into malleable iron.

"(2) **Gray Pig Iron** in which more or less of the carbon is present in the form of graphite. The metal is soft, tough, gray to black, and is used for conversion into malleable iron or for the production of castings.

"(b) **STEEL** with 1.6 per cent to

0.4 per cent of carbon, melts at 1400 deg. C. to 1500 deg. C. By sudden cooling of a red-hot mass, the hardness is considerably increased.

"(c) **WELD IRON** with less than 0.2 per cent of carbon, melts at 1600 deg. C. and above. It cannot be appreciably hardened.

"The Philadelphia Commission decided that:

"(a) Every malleable compound of iron, containing the ordinary elements of that metal, which is obtained either by the union of pasty masses of iron or by any process not involving fusion, and which cannot be hardened by the ordinary method, shall be called *weld iron*. This is what has formerly been known as wrought iron.

"(b) Any analogous compound, which by any cause hardens, shall be called *weld steel*. This has hitherto been termed puddled steel.

"(c) Every malleable compound of iron, containing the ordinary constituents of that metal, which is obtained and poured in the fused state, but which does not harden by the ordinary methods, shall be known as *ingot iron*.

"(d) Every compound similar to the last, but capable of hardening from any cause whatever, shall be called *ingot steel*."

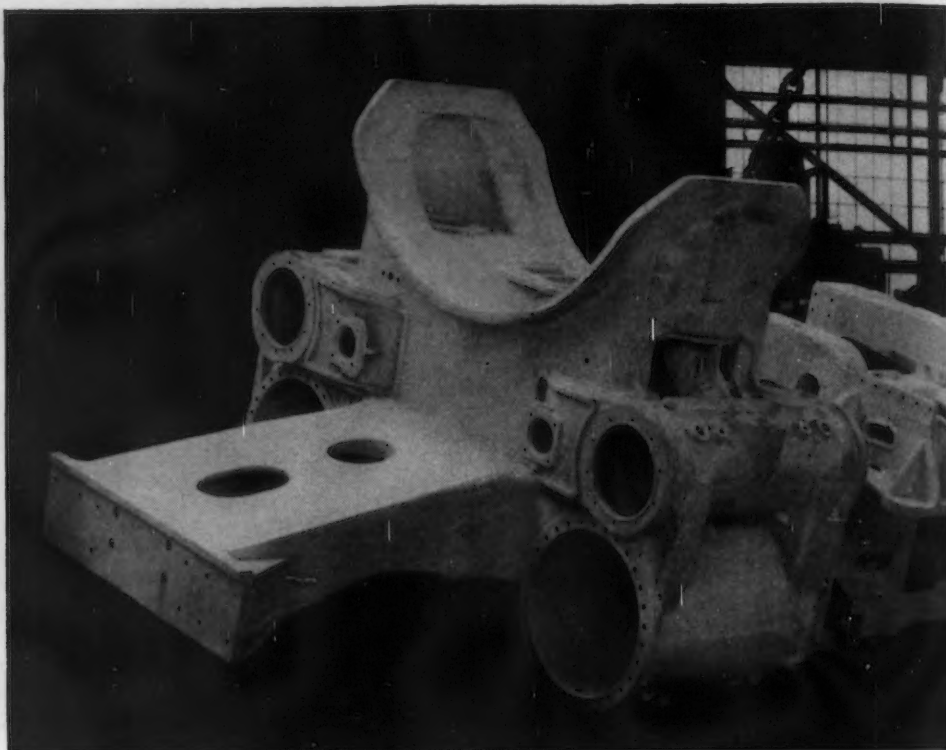
Three Kinds of Iron

From Murray's Dictionary, 1901:

"IRON is of three kinds, differing in the proportion of carbon present and in properties: Malleable or wrought iron, which is comparatively soft, very tenacious, fusible only at a very high temperature and capable at a red heat of being hammered or rolled into any re-

(CONTINUED ON PAGE 104)

FIG. 1—Bed casting for 4-8-4 type locomotive.



Large Locomotive Bed Castings



THE recent development in locomotive bed castings, with cylinders and cradle cast integral, has presented many problems in machining and made necessary very large and powerful machinery to economically finish these castings. The castings were first made in Granite City, Ill., by the Commonwealth Steel Co., which is now known as the Granite City plant of the General Steel Castings Corpn. Another plant of this corporation is located in Eddystone, Pa., and both plants are fully equipped to cast and machine these large bed castings.

When the manufacture of this large type of locomotive bed was first contemplated by the Commonwealth Steel Co., the engineers were confronted with other problems than those which originated in the foundry. Granted that successful castings could be molded, it was highly important that the cast-

ings, could be economically machined. Although the shop was well equipped with machine tools for operations on trucks, cradles and smaller frames, this equipment was not suitable for operations on the large one-piece bed castings.

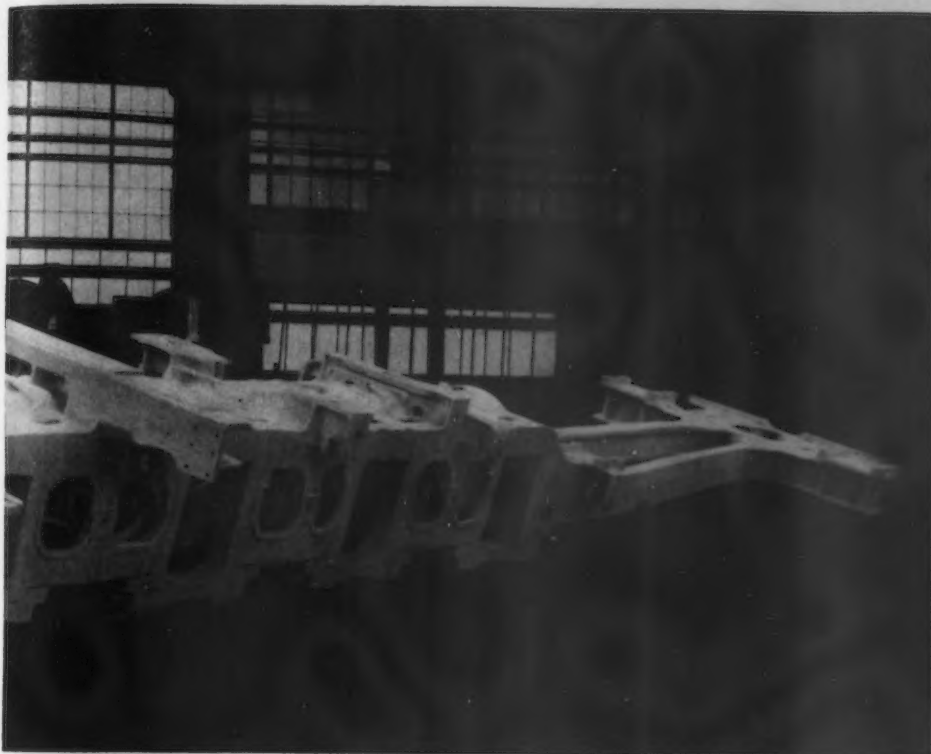
At this time the use of milling machines was rapidly increasing. Although the milling of steel castings had not advanced as quickly as the milling of iron castings, it was decided to perform the principal operations on milling machines. However, in addition to the milling operations, certain planing, cross planing and slotting operations were still desirable, and numerous boring and drilling operations were necessary.

Considerable preliminary engineering work was performed by the machine tool builders to establish the feasibility of the machining operations on these large castings. Prominent among these builders were the Ingersoll Milling Ma-

SUCCESSFUL production of one-piece locomotive bed castings by the General Steel Castings Corpn. has involved problems of the machine shop as well as of the foundry. With the co-operation of machine tool builders suitable methods and equipment were initially worked out. Later, they were improved upon, and more recently changes have been made and more equipment installed to handle

chine Co. and the Consolidated Machine Tool Corpn. of America, which have built most of the heavy equipment now in use.

One of the large locomotive bed castings is shown in Fig. 1. These



By M. M. McCALL

Machined on Special Equipment

one-piece beds that incorporate additional parts and features required by different railroads. Major operations and some of the large milling machines developed for this work are described in this part of Mr. McCall's article: cross-planing, boring and other machines and operations are dealt with in the second part, to appear in an early issue.

castings are a beautiful piece of work and a wonderful example of the molder's art.

After cleaning, the casting is placed bottom side up on a large faceplate and is laid out in a pre-

liminary way to ascertain how the surfaces to be machined line up and register with each other. Two hydraulic straightening machines, one to apply pressure horizontally, and the other vertically, are located adjacent to the laying-out faceplate. Each machine has a number of plungers which may be properly located to apply the pressure to straighten the casting. After the straightening operations, the casting is returned to the laying-out faceplate, where it is correctly laid out for the subsequent machining.

The machine tools which have been developed for these operations make a very impressive spectacle at both the Granite City and the Eddystone shops. All these machines are large, heavy and powerful; and all are of rugged construction to withstand the heavy duty required of them.

When the manufacture of these large castings was started very little past experience was available

for guidance. It was almost necessary to start from scratch. The new machines added from time to time reflect the experience gained from actual operations. The first milling machine was provided with two rail heads and two side heads. It was built to handle practically all of the milling operations on the bed castings and in addition performed some boring and drilling operations. When additional milling machines were ordered, it was thought best to divide the operations between two machines. One machine was built with two rail heads as shown in Fig. 2. The other, shown in Fig. 3, was built as a straddle-type machine with two horizontal spindles supported in a large casting which could be fed or traversed vertically on the housings.

The locomotive bed castings are much wider through the cylinders than through the pedestals. The width between housings on all ma-

chines is sufficient to permit the passage of the cylinders between them. When the side heads on the four-head machine were used to mill the pedestal surfaces, it was necessary to extend the quills a considerable distance from the heads. While provision was made to support the quills in their ex-

a single rail head similar to the Ingersoll machine shown in Fig. 4. After the pedestal surfaces are milled, the rail head is used to mill the surfaces for the binders. Before the casting is taken from the machine, the binders are clamped in place to prevent the casting from springing when it is moved.

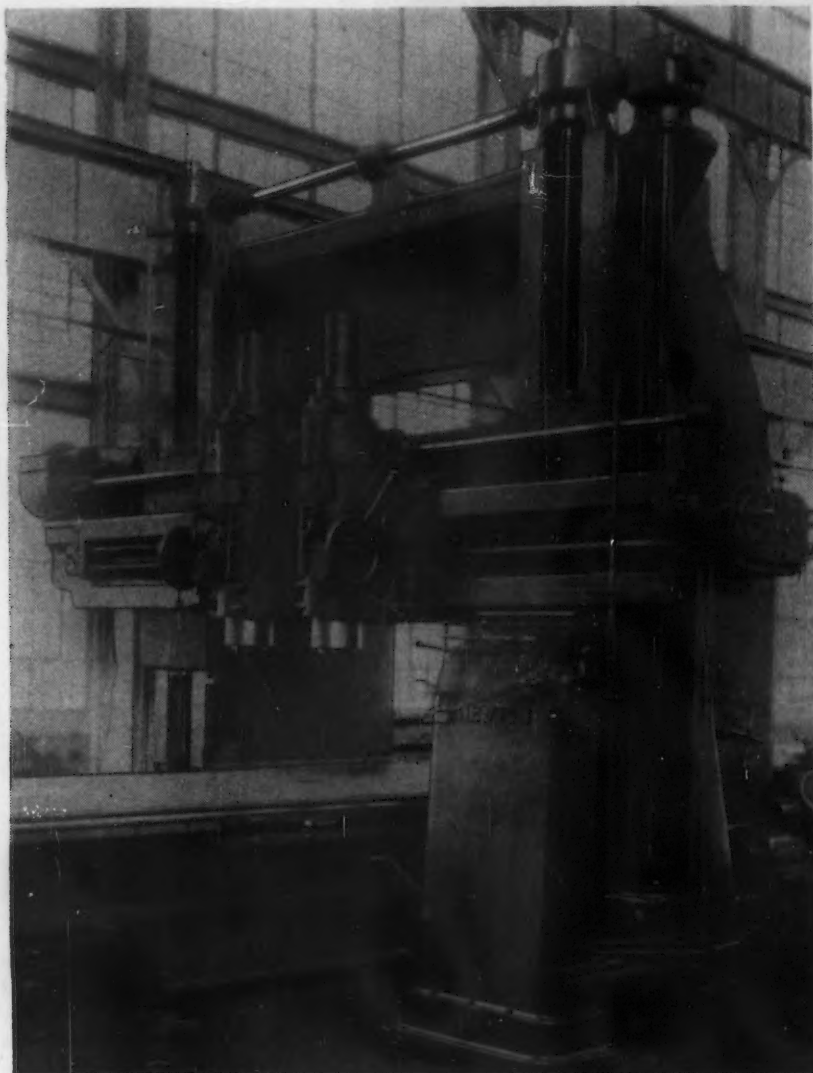


FIG. 2—Newton planer-type milling machine equipped with two rail heads.

tended positions, they are held more securely without overhang in the straddle-type machine.

A web of metal is cast across all of the pedestal openings to prevent the casting from springing. When the pedestal surfaces are milled on a straddle-type machine, this web of metal is removed. Great care must be exercised when moving the casting before the binders are in place across the pedestal openings. All of the later straddle-type milling machines have been built with

When the holes for the binders are drilled, the binders are bolted in position and remain that way during all subsequent operations. The binders are bolted in position on the casting shown in Fig. 1.

The popularity of the one-piece locomotive bed casting has grown steadily since its introduction, and because of the increased use of these bed castings by different railroads, it has been necessary to incorporate additional parts and features on the castings. Many of

these additions and changes have necessitated different machining methods.

One of the latest changes requested was the casting of the rear cylinder heads integral with the cylinders. The small hole for the piston rod and the stuffing box is the only hole in the rear cylinder wall. The cylinder boring machines were designed to bore the cylinders from the rear. The integral rear cylinder walls have made it necessary to bore the cylinders from the front. The operation of facing the rear wall has been added. Elaborate facing heads are required for this operation. When conical pistons are used, conical surfaces must be faced on the walls. Lugs are cast on the outside of the rear cylinder walls to support the valve rod guides. Additional milling operations are required to square off these lugs.

The trend toward high-speed engines with high steam pressures will result in other machining changes. One of these engines, built by the American Locomotive Co. for the Chicago, Milwaukee, St. Paul and Pacific Railroad, was completed recently at Schenectady. This engine has a bed casting made by the General Steel Castings Corp. Because of the higher steam pressure, the bore of the cylinder is only 21 in. The boring spindle supports on the cylinder boring machines are 20 in. in diameter. Any further decrease in the bore of the cylinders will necessitate changes in the cylinder boring equipment.

Planing vs. Milling

The large number of milling operations performed on these castings has resulted in the establishing of a large department for the sharpening and upkeep of the milling cutters. This department is maintained at a large expense which is offset by the saving in machine hours.

Planers are still used, however, and no doubt will continue to be used. With the exception of the pedestal surfaces, no set rules are made as to which surfaces are to be milled or planed. The operations depend to a large extent upon the volume of work going through the shop, the sequence of the operations, and the availability of the different machines as the work moves through the shop.

As both milling and planing operations are performed on these

large castings, it has been possible to make a comparison of the operations. It is the opinion of the superintendent of the finishing department at the Granite City shops that the milling time should cut the planing time in half to give an equal total cost when the cost of cutter upkeep is taken into consideration.

New Welding Application

Recently, the General Steel Castings Corp. has made a large number of bed castings for the electric locomotives being built for the Pennsylvania Railroad. A new method of holding these castings on the tables of the large milling machines is being tried out with success. When these large castings are clamped to the table of the machine, it is difficult to prevent springing the casting. To reduce the possibility of springing, the surface of the casting which is to be next to the table of the milling machine is temporarily welded to several small auxiliary castings. These castings are clamped to the milling machine table when the bed casting is properly leveled. During the machining operations, the casting is held entirely by the welds. After machining, the welds are chipped away to remove the auxiliary castings.

Straddle-Type Millers Employed

Many large machines of unique design are used to machine the large locomotive bed castings.

Fig. 5 shows two Ingersoll straddle-type milling machines, with a central rail head, installed in the Eddystone shop. A clearer view of one of these machines may be seen in Fig. 4. The spindles are driven by a 50-hp. motor mounted on the crossrail. Feed and rapid traverse is furnished by a 25-hp. motor mounted on the right-hand housing. The crossrail has long wings on each end extending quite a distance below the lower way for the central rail head. These wings form long bearing surfaces for the crossrail on the face of each housing. Also, a surface is machined near the bottom of the wings which adds a third way to the crossrail and provides a wide rail face for the two outer heads. These heads are adjustable on the crossrail to suit the width of the work. The feed box on the right-hand housing provides feed and traverse to the table on the bed, cross feed and traverse to the rail head on the crossrail

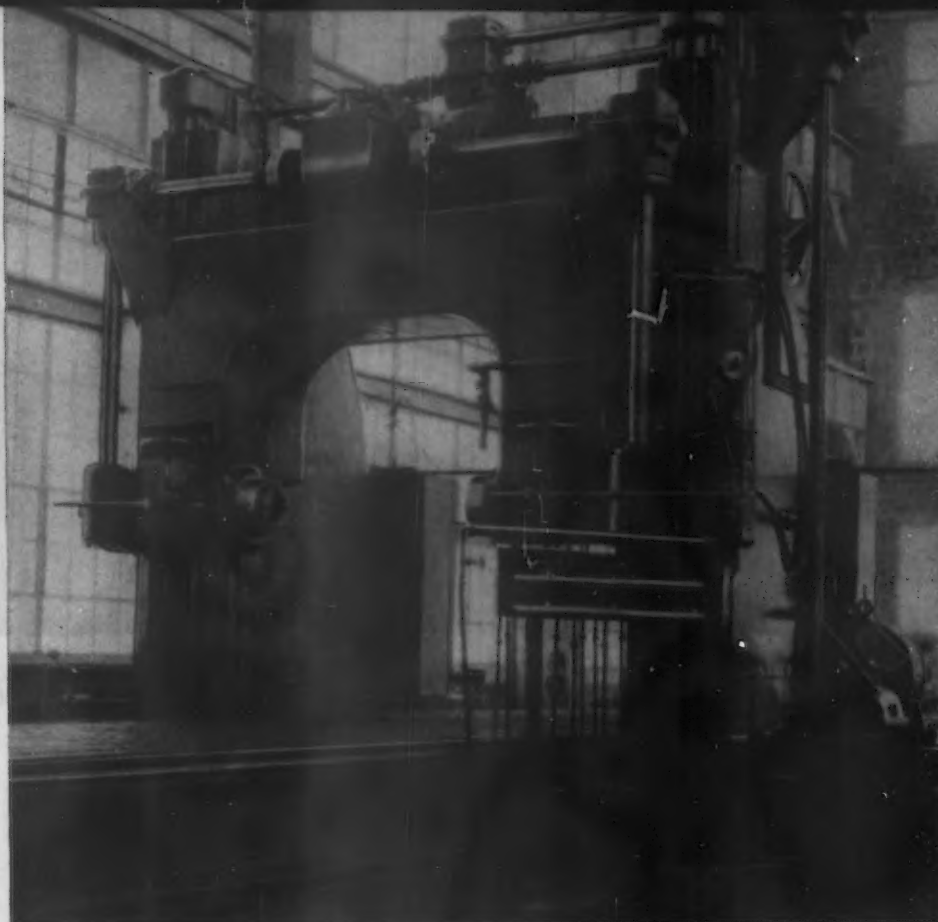


FIG. 3—Milling machine (Newton) with two horizontal spindles, used entirely for straddle milling operations.

and vertical feed and traverse to the entire crossrail assembly on the housings.

When milling the angular pedestal surfaces on the bed castings, the table feed and vertical crossrail feed are used simultaneously. Suitable gears are provided to vary the feeds in the right proportion to obtain the required angles. A right angle milling attachment,

shown in Fig. 5, is used with the central rail head. To feed the cutter on this attachment vertically, the entire rail assembly is fed on the housings. This machine has a table 60 ft. long. It is 11 ft. 10 in. between housings and 9 ft. under the central crossrail head. The machine is controlled from a pedestal on the right-hand side of the table.

Fig. 3 shows a Newton straddle-

FIG. 4—Another straddle-type milling machine—this one equipped with a central rail head.



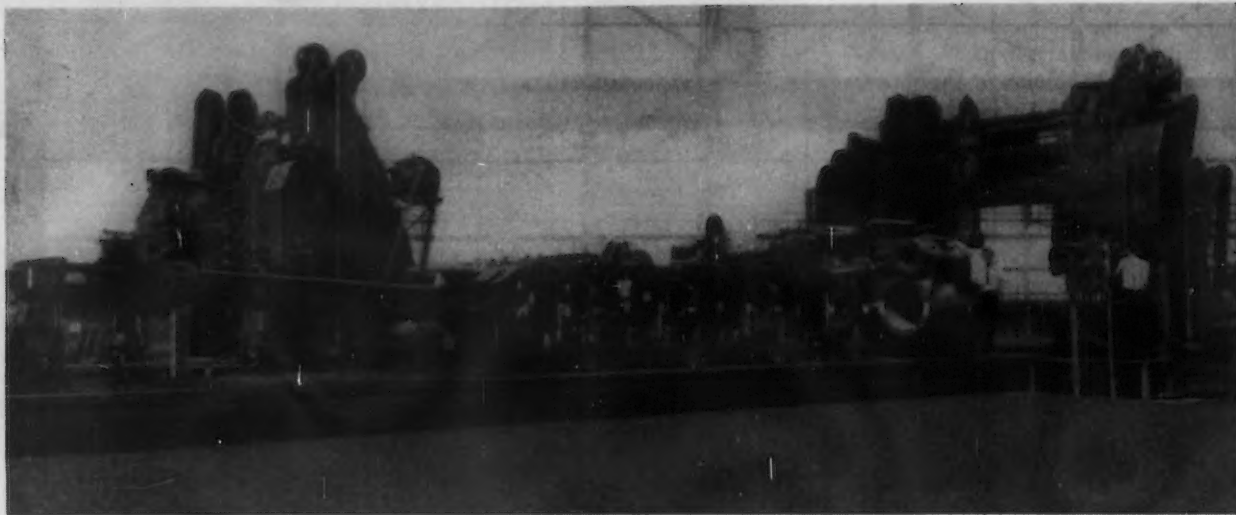


FIG. 5—Two Ingersoll straddle-type machines at the Eddystone shops of the General Steel Castings Corp'n. A right angle milling attachment is used with the central rail head.

type milling machine, which is used entirely for straddle milling operations. Two horizontal spindles in the wings of a heavy cross casting are driven by a 50-hp. motor on the top surface of the casting. A 25-hp. motor supplies feed and traverse to the table along the bed

and to the cross casting vertically on the housings. Both feeds, with suitable gears, may be engaged simultaneously to mill the angular pedestal surfaces. The table is 54 ft. long, and the maximum distance between spindles is 74 in. The clutches are shifted pneumatically.

Newton and Ingersoll planer-type milling machines are shown in Figs. 2 and 6 respectively. Both machines have two heads on the crossrail, driven by 50-hp. motors. Feed and traverse boxes located by the right-hand housing are driven by 25-hp. motors. Feed and traverse is furnished to the table on the bed, the heads on the crossrail, and the crossrail vertically on the housings. Vertical milling attachments may be applied to the heads. The machines have about 11 ft. between housings and 9 ft. under the tools. The tables are 55 and 60 ft. long. The clutches are shifted mechanically from an attached pedestal control station.

(To be continued)

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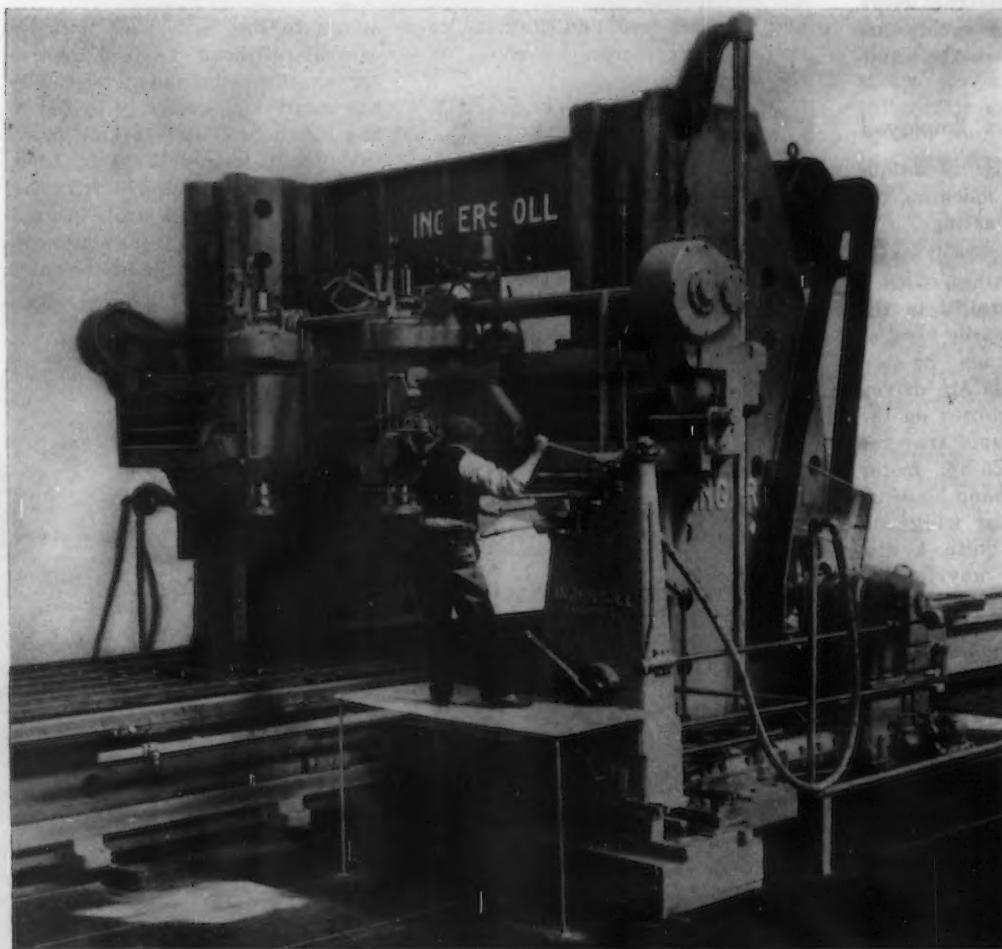


FIG. 6—Another planer-type miller with two heads on the crossrail, driven by 50-hp. motors.

Large Automotive Die Castings

Upset Predictions as to Commercial Ranges

• • •



THE die casting industry is playing an increasingly important part in the production of things commonly used in sufficient quantities to warrant die expenditures of up to \$14,000 for single dies. This is well illustrated by the automobile radiator grille and certain decorative units offered to the public by automobile manufacturers as a stimulus to demand, through improved "appearance."

Somewhat makeshift conceptions of the radiator grille, while based upon ornamentations and a certain amount of protection for the radiator, in earlier days figured largely as extras outside of regular assembly line considerations.

Today, because of die casting progress, the grille has become an assembly unit in automobile construction.

The suddenness of today's progress can be pointed out by relating the fact that barely two years ago a prominent die casting manufacturer placed restrictive size range limits upon the future of the industry. As a producer, he said in effect, "The successful efforts of the industry will be permanently limited to a production of the smaller run of parts and the industry will be competitive with stampings and with the foundry on such work only. Chronic headaches will be the total reward of those who at-

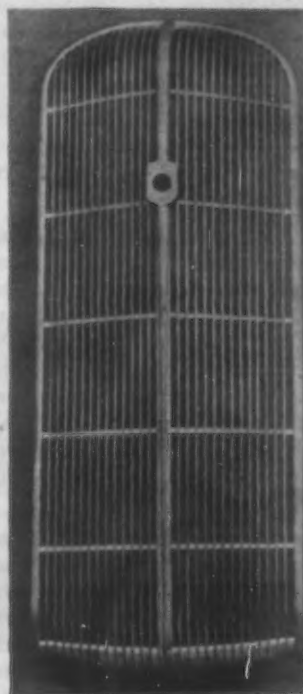
By L. M. WAITE

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tempt to develop markets for large die casting work." He outlined various production restrictions which he called "difficulties unsur-

mountable from a commercial standpoint."

The particular illustrations here presented, represent results from research and experimentation by the Doehler Die Casting Co. The products shown are being made on a production basis at the company's Toledo, Ohio, plant. These indicate the extent of effort toward attain-



LEFT
FIG. 1

• • •



RIGHT
FIG. 2

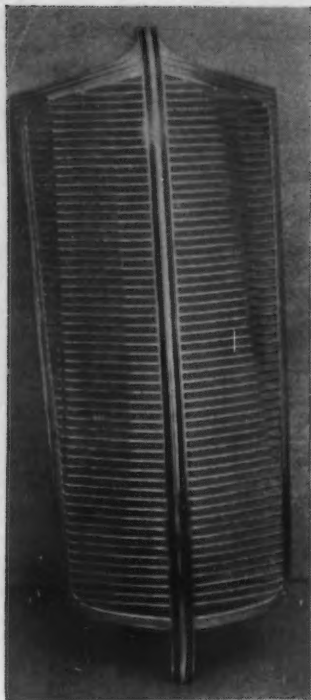


FIG. 3

ment of mechanical perfection, which in combination with metal purity have greatly reduced limitations heretofore prescribed by "size."

It will be noted that the Nash, Fig. 1, and Reo grilles, Fig. 2, are over 37 in. in height and average

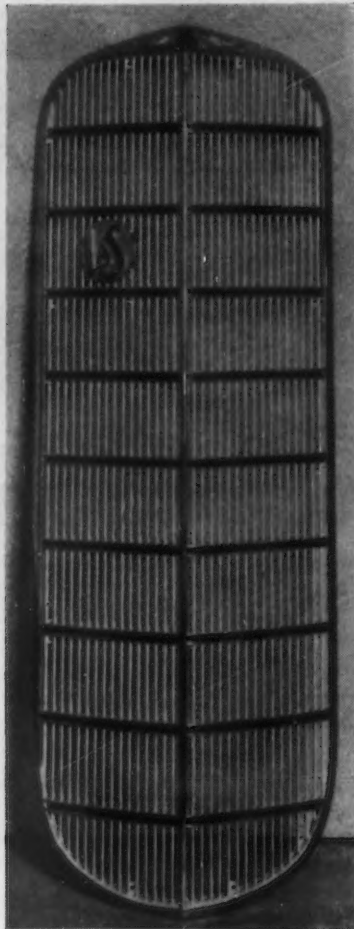


FIG. 4

14 in. in width. The Nash weight is 18 lb., while that of the Reo grille is 12½ lb. The Reo perpendicular leaves, have a front finished face of 3/16 in. and taper back slightly to the inside of the grill, with seven external, horizontal ribs, shaped for the application of chromium finish.

The perpendicular Nash leaves have a ½-in. plus front and back leaf face with five internal, longitudinal supporting ribs.

The DeSoto grille, Fig. 3, has horizontal leaves 3/16-in. front face, tapering to the inside. The height is 36½ in.; the maximum width 15 in., tapering down to 12½ in. at the bottom of the grille. The front center vertical strip is cast with two recesses, running vertically and providing for the application of color finish. This grill weighs 11¼ lb.

The LaSalle grille, Fig. 4, has vertical leaves and nine external, longitudinal ribs—these ribs ¾ in. wide are recessed for the application of finish effect in color. Its height is 33¼ in., width 12 in., vertical leaf thickness 1/16-in.-plus,

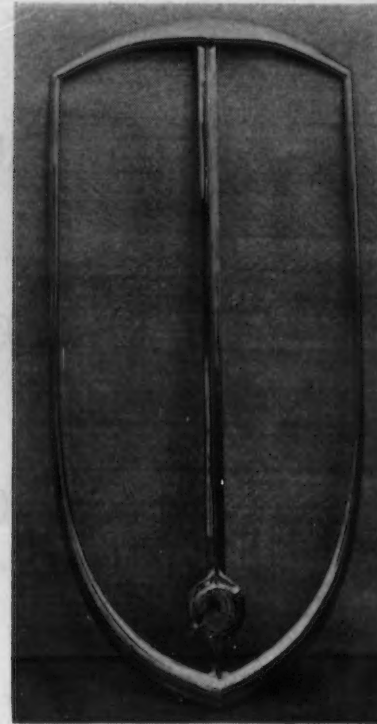


FIG. 5

longitudinal rib face ¾ in., weight 13¼ lb. All grilles are provided with proper attachment lugs. The casting operation does not involve the use of heavy pressure equipment.

Illustrations are also shown of die cast grill-frames used on



FIG. 6



FIG. 7



FIG. 8

Pierce-Arrow, Studebaker and Cadillac cars. The Pierce-Arrow frame, Fig. 5, presents 38 in. of height and 18½ in. of extreme width in a casting having an average of ⅜-in. wall and weighing 4½ lb. Into rear die-cast lugs, assemblers insert steel leaves of chosen design. A simple pressure on the lugs, retains these with required practical solidity.

The Cadillac frame, Fig. 7, is 31½ in. high, 13½ in. wide, 3/16 in. thick and weighs 5½ lb. The frame, Fig. 6, used by Studebaker is 36½ in. high, 13 in. wide, has 1/16 in. section thickness and weighs 3 lb.

The Cadillac die cast instrument panel shown in Fig. 8, is 42½-in. long, 6¼ in. wide and weighs 8½ lb. Four longitudinal recesses are cast for the insertion of varied length, ornamental steel strips which produce the total effect of a flat surface, for the front of the panel. Instrument openings all provide for rapid assembly, and lugs insure instrument locking on a production basis.

In the louvre illustrations, Fig. 9, the length of the louvre shown at the left is 43½ in., width 2¼ in., section thickness 3/16 in. and weight 3¼ lb. Five rear tying ribs are cast. The center louvre is 36

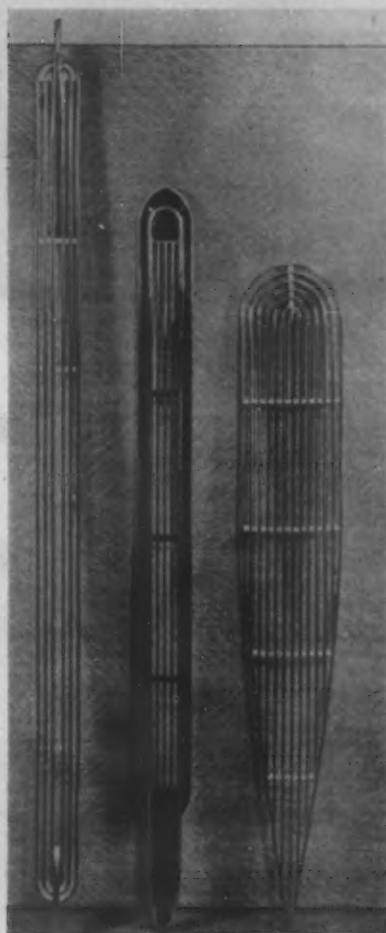


FIG. 9

in. long, 2¼ in. wide, has an average thickness of ⅜ in. in its various sections, and weighs 3¼ lb. There are three rear ribs and die provision is made for recessing at outer edges for the application of color finish. The taper pointed louvre is 32 in. in length, has 5 in. width as a maximum and the walls of its sections are ⅜ in. There are four horizontal and one vertical rear tying ribs.

Ability to "take" finish is characteristic of the metal used in die casting these units, and this ability provides the leeway necessary to color schemes in the many models of different cars. The die maker's art and experience provide for the application of finish both over and within defined areas.

The extent to which the automotive industry has desired to aim for appearance in meeting the peculiarities of its design-conscious public, has truly been a chronic "head-ache" for engineers of the die casting industry. Practical requirements of that industry have necessitated utmost cooperation on the part of artist consultants as to the technicalities involved. This cooperation has played no small part in opening up this large parts automobile field to the die casting industry.

Sheet Prices Declined More Than Automobiles

SINCE 1926 the average price of sheet steel, one of the most important materials used in automobiles, has declined relatively much further than the price of automobiles, according to the American Iron and Steel Institute.

From 1926 to 1933 the index of average automobile prices compiled by the United States Department of Labor dropped only about

10 per cent, while in 1934 the index rose to a point only 4 per cent below 1926.

Sheet steel prices, however, dropped 45 per cent between 1926 and 1933, and in 1934 were still 35.5 per cent below the 1926 level, according to an index of sheet steel prices based on the average price received per ton of sheets shipped each year by one of the most prominent producers of this product.

Great improvements in the quality of both automobiles and sheet

steel have been made since 1926. The improvements in motor cars are obvious to every automobile owner or rider, but knowledge of the better quality of sheets now produced by the steel industry is limited chiefly to the producers and to those who use them to make automobiles and other products.

Nevertheless improvements in sheet metal quality, most of which have come in the past ten years during which prices have been generally declining, have made possible many of the refinements of modern cars.



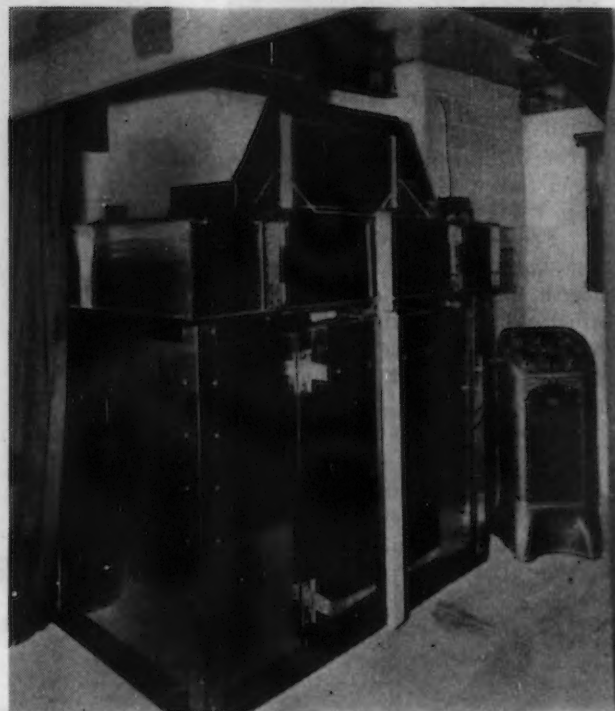
All Steel and Arc Welded

NOT a single piece of wood is being used in this all-steel house, which is being erected at Troy, Ohio, by the Hobart Brothers Co., manufacturer of Simplified arc welders. A low-cost prefabricated panel construction is being used in an effort to pave the way for general construction of this type of house by private contractors. The joints of the wall panels are apparent in the illustration. The roof is also constructed of prefabricated steel panels. Joining of all panels is accomplished by arc welding, making the entire house a solid, integral unit.

High Schools Study X-Ray Phenomena

THE value of radiographs to foundrymen and welders is well recognized today. And in teaching this and related subjects to students, there is nothing so fascinating and convincing as a picture which will show the true interior conditions of materials being studied. For this purpose X-ray equipment is being installed in various schools, and this equipment must be rapid, economical, ray-proof and electrically safe. All of these features are incorporated in this first St. John X-Ray Service, Inc., educational unit which has just been placed in operation in the new Brooklyn, N. Y., Technical High School.

As the photograph shows, the unit consists of a heavy lead-lined cabinet which incloses a standard 200,000-volt X-ray generator and an air-cooled tube. X-rays are permitted to escape from the cabinet only through a single window in the top, and this opening is provided with a shutter, adjustable so that the area exposed to X-rays can be varied from zero to the full size of the window. A specimen box fits over the top of the base cabinet. Safety switches on the doors disconnect the tube when the cabinet is opened, a fluoroscope is provided for direct visual inspection, and a pinhole instrument can be used for high-speed diffraction analysis of metals.



THIS is believed to be the first moving van to be built with an all stainless steel body. The body was built of Enduro 18-8 No. 4 stainless steel manufactured by the Republic Steel Corp. It was built by Herman Kirstein, Philadelphia.



FACADE of steel-frame house across sunken garden. This home contains seven rooms, two baths and a two-car garage. Elimination of gables makes second-floor sun decks possible.

The Motohome — a Prefabricated Steel-Frame House



THE Motohome, a prefabricated steel-frame house, represents a radical departure from past practices in home building construction. Developed by American Houses, Inc., 480 Lexington Avenue, New York, it is designed for mass construction. Standard prefabricated parts are assembled at distribution depots and from these are shipped by truck to the construction site. The assembly of the prefabricated materials on the foundation requires only two to three weeks, the longer period representing the erection time for the larger homes. While the Motohomes are characterized by solidity and strength, and are not to be confused with "portable" houses, they may readily be "unbuttoned" for the addition of extra rooms.

Likewise they can be taken down and erected on another site. Thus standardization has been achieved without sacrifice of flexibility.

In designing a house for a mechanical age, the developers of the Motohome started with a conception of the home as a mechanical unit. Just as the automobile is built around its motor the Motohome is built around a "moto-unit." This mechanical nerve center is set into the main floor construction, eliminating the need of a cellar, and contains, in a steel cabinet hardly larger than a pantry, heating, hot water and air-conditioning units, all basic plumbing and electrical work and a single switch board that automatically controls all working parts of the house. The location of this room is between the kitchen and

the bathroom. In two-story models the moto-unit extends to the second floor to serve additional baths.

The amount of steel used in the construction of a Motohome ranges from about 1½ tons for the smallest model, with four rooms and bath, to 2¼ tons for a seven-room house. The Motohome is set on a concrete footing which extends well below the frost line—3½ ft. in New York and vicinity and 4½ ft. in the more rigorous climate of upper New York State. Three feet of earth is excavated and then steel truss beams, 16 in. in depth, are laid on the foundation at 4-ft. centers. The truss joists are made of 1½ x 2-in. angles welded to ¾-in. rounds. A steel sill, made of a 2½ x 2½-in. angle, extends around the entire foundation. It is bolted to the joists and to the



KITCHEN, showing single straight-line unit of enameled steel, topped by Monel metal, in which are built stove, electric dishwasher and dryer, refrigerator, sink and work board, with drawers and cupboards within convenient reach, both above and below. Electrical exhaust combined with air-conditioning protects the housewife from uncomfortable temperatures. A shadowless indirect lighting panel (above) and an electric clock are other features.

foundation, and at the same time is secured by bolts to the steel studs. The studs, which are on 4-ft. centers, are made in box-like sections pressed from No. 12 gage black sheets to which a $\frac{1}{8}$ -in. steel strip is welded on the closed side. The box-like cross-section is

3 in. wide, while the strip of plate attached to it is 4 in. wide. The strip, which faces the room side of the stud, is designed to receive the wall panels on either side of the stud.

The outside wall panels, which are made of Pyrestos, consisting

of cement and asbestos with a rigid insulating core between, compressed together with water-proof cement under hydraulic pressure, are held together by vertical aluminum alloy extruded shapes. A recess in the aluminum pilaster has been provided where holes are



LIVING ROOM, with wood-burning fireplace. Note corner assembly of steel casement windows.

drilled for 5/16-in. cadmium-plated bolts, which fasten the pilaster to the wall panels and the overlapping ends of the box-section stud. The heads of the bolts are then covered with a heavy layer of insulating felt, following which the entire recess is filled with mastic. Another aluminum alloy shape is then sprung into the edges of the recess, entirely concealing it and giving the assembly of two aluminum pieces the appearance of one integral unit.

The interior walls are made of a mineral compound and are covered with a washable, non-fadable parchment, called Amfab.

The same type of steel trusses used for the floor are also used for roof joists, being bolted to the studs. The roof material is a mineral compound known as Minropak. It is 2 in. thick, reinforced with steel. The finished surface of the roof is made of cement and asbestos. Drainage of the roof is to the center. A fiber insulating material 3/4 in. thick is attached under the roof joists to form the ceiling.

The floor is made of 2-in. mineral panels reinforced with steel, the same material that is used for the roof. The floor covering is made of compressed hard wood fibers. These fibers have been exploded under great pressure and then pressed into sheets, known as Mirofloor. The material has a rich dark color and retains a high polish with occasional waxing.

The floor joists are also sealed in at the bottom, so that an air chamber, 16 in. in depth, is formed underneath the floor. This chamber, with registers opening into the rooms, becomes part of the heating and air-conditioning system of the house.

Heating may be by oil, gas, coal or electricity. When heating is by oil, an oil storage tank is provided underneath the floor. The air-conditioning system circulates warm humidified air in the winter and dehydrated air in the summer. Air-refrigeration equipment is optional, since the circulation of air in summer provides a sufficient drop in temperature, in many localities, to keep the house comfortable.

Approximately 3100 lb. of enameled steel sheets have been used in the kitchen and bathroom for cabinets, drawers and trim. Thicknesses range from 22 gage to 13 gage, though Nos. 16, 18, 20 and

22 are used in largest quantity. Arrangement of equipment in both bathroom and kitchen is for maximum convenience and economy in effort. This is particularly evident in the kitchen, which is laid out as a workshop, for maximum results with a minimum of lost motion and physical strain.

Arranged compactly in a con-

placed by an electric dishwasher and dryer.

Steel casement windows are used throughout the house, and these are placed at room corners, since, with air conditioning, cross ventilation is not required. The windows are operated by an inside crank and lock automatically. Each window is equipped with curtain



THE mechanical unit of the bathroom is an enameled steel insulated cabinet to which the tub, the wash basin and the toilet are attached. The wash basin recedes back into the unit, saving space. The basin is large enough to wash a baby in. Below the basin is an auxiliary electric heater which blows warm air into the bathroom at seasons when the furnace would not normally be in operation. Above the basin is a triple mirror, each section of which may be adjusted so that one can see all angles of one's face when making one's toilet. Behind the mirrors are steel medicine cabinets. The bathroom, like the kitchen, is equipped with indirect lighting panel (above mirrors) and electric clock.

tinuous straight line are electric refrigerator, sink, laundry tub and stove—all contained in an enameled insulated steel cabinet, covered over by a continuous flush metal work top of Monel metal. In larger houses, where a separate laundry room is provided, the laundry tub in the kitchen assembly is re-

placed by rods and hinged screens. For northern climates storm windows, interchangeable with the screens, are provided at extra cost.

Model Motoshomes are on display at White Plains, N. Y., Garden City, Long Island, New York City, Philadelphia and Cambridge, Mass.

(CONTINUED ON PAGE 100)



Buick Anodizes Pistons On Production Basis

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THIS ingenious device measures thickness and hardness of anodic coating by sand blasting until electric circuit is established by exposure of bare metal. In operation the mechanism is enclosed as a protection for the inspector.



AUTOMATIC operation and close control are features of the completely conveyORIZED installation for anodizing alloy pistons at the plant of the Buick Motor Co., Flint, Mich. Anodizing, a recent development in metallurgical treatment, gives the pistons a hard, long-wearing coating integral with the metal.

The process in effect is a "de-plating" operation. Instead of depositing material on the piston, the electric current in the bath is reversed to change the surface metal of the piston to a hard oxide, thereby greatly increasing the life of the alloy pistons.

In the Buick set-up, pistons are hung on specially designed racks which form the electrical contact for the pistons. These racks are lifted up by an overhead conveyor

and deposited in the first bath, which contains a chemical cleaner to remove all foreign material. They remain in this bath for a definite period of time and then are picked up by another chain conveyor and carried over and deposited in a water rinse tank.

From this tank they are transferred by a third continuously running chain conveyor to the anodizing bath. The latter unit is U-shaped, the racks and pistons gradually moving around the U over a 15-min. cycle. At the end of their travel, they are automatically lifted out and deposited in a cold-water rinse, and then in a hot-water rinse, to remove all traces of chemicals in the anodizing bath. When taken from the hot-water rinse tank by the conveyor provided for that purpose, the pistons are removed from the racks for fin-

ishing. The racks, however, continue on into another bath in which the current is the reverse of that in the anodizing bath. The object of this portion of the cycle is to remove all traces of oxide from the contact points of the racks, since the oxide is a non-conductor. The racks then travel on around the loop, ready to receive another set of pistons.

An unusual development is to be noted in connection with the temperature of the anodizing bath, which is held within plus or minus 1 deg. F. The bath, which is continuously agitated, is cooled by means of conduction through the walls on the inside of the U, where a large cold-water tank is located.

Water for this tank is from a special well, sunk 354 ft. deep to assure an adequate supply at a constant temperature. The water

from that depth is almost ice cold. It was discovered that the variation in temperature encountered with city water did not give the close control desired at Buick. The temperature is further regulated through pyrometers in the plating bath and through control of the flow into the cooling tank.

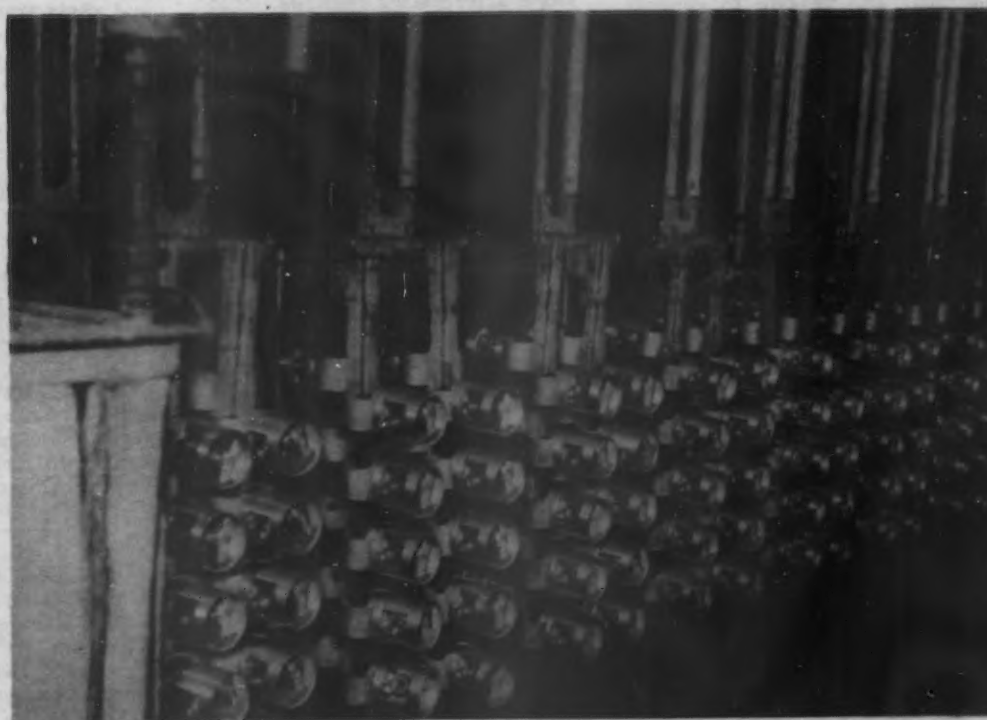
The non-conductivity of the oxide makes possible an ingenious checking method to determine hardness and thickness of the anodic coating on the piston. Sample pistons are mounted in a fixture enclosed within a specially designed sand-blast machine. Across the skirt of the piston are placed contacts in series, with a special current supply and an electric lamp. The sand blast is turned on and the time required for the special grit to cut through the coating is measured. When the coating is cut through, an electric circuit is established, and the lamp lights up. The time required for the sand blast is a direct measure of the combined hardness and thickness of the coating.

Racks carrying the pistons through the cycle are coated with a non-conducting material, except at the contact points with the pistons.



TIME cycle for anodizing pistons is controlled by regularizing speed of conveyor which carries racks through this U-shaped tank. Note cold water tank in center which cools anodizing bath by conduction through walls. Ventilator ducts carry away any gases.

BUICK has put anodizing of pistons on a mass production basis for the first time: Note how pistons are carried on racks suspended from monorail conveyor.





Improvements in Production

Improved No. 4 Universal Turret Lathe Has New Head Assembly

A NEW 4-A universal turret lathe was shown for the first time at the recent machine tool show in 8 in. and 9 in. spindle capacities and 28 1/4 in. swing, by Warner & Swasey Co., Cleveland.

The spindle is mounted on Timken precision bearings at the spindle nose end, and on precision straight roller bearings at the rear end. All head shafts are mounted one above the other to the rear of the spindle, thus placing the gear train entirely to the rear. This design provides for increased rigidity and larger spindle.

Increased depth of bed section reaches down almost to the chip pan. Passage for chips is through arched holes under the rear way of the bed. A new cross slide and square turret offer improved rigidity, featured by a square lock gib. This is used in combination with the conventional dovetail on the opposite side of the cross slide. The construction offers improvement in absorbing strains from overhanging tools and is said to support even the heaviest cuts taken by

carbide cutters with noticeable absence of vibration. Load taking means is here provided with a flat surface at right angles to the load. Replaceable steel wear strips have been added to the seat of the cross slide to further preserve the initial accuracy.

The square turret is made from a solid forging and has an internal circumference clamp ring for elimination of any tendency at this point toward looseness due to excessive wear. The turret indexing clamp handle is located in front away from interference with hexagon turret tools when indexing, thus permitting indexing in tight positions. As optional equipment, an open type square turret can be furnished which permits multiple tooling and the holding of long shank forming tools. Conventional rockers are replaced by shims to elevate the cutting tool to the correct height. This construction is considered essential on carbide tools to insure the correct cutting angle after cutter regrinds.

Automatic lubrication is pro-

vided from the ways to the bed. Both hexagon turret slide and square turret carriage are equipped with an oil reservoir and a Bijur pump, automatically actuated by any travel of the slide. The oil reservoir is a glass chamber, entirely separate from the apron mechanism, and completely sealed against coolant. Patented way covers are employed as on previous models.

A direct reading indicator in the head gear shift affords increased ease of operation and enables ready selection of spindle speed without reference to diagrams or charts.

Rapid traverse is offered as optional equipment for the cross slide. An electric unit mounted in front of the hand wheel and equipped with a built-in switch, has large contacts which permit the quick and effortless control of the cross slide in either direction. The cross slide hand wheel is of heat treated aluminum alloy to reduce momentum.

Independent lead screw features threading operations. A solid lead screw is provided which is independent in its function from the feed shaft, and is used for threading purposes only while all feed and rapid traverse functions operate through a rack and pinion. By such means, the accuracy of the lead screw is preserved. Pick-off gears provide for whatever pitch of thread is to be cut. A feature of this unit is the quick return of carriage at a constant speed of five feet per minute. This is independent of spindle speed and is accomplished through a convenient lever on the apron without reversing or stopping the spindle.

Thwing Instrument Co., Philadelphia, maker of pyrometer apparatus and paper testing instruments, will hereafter be known as Thwing-Albert Instrument Co.

Otis Steel Co., Cleveland, has established an office in Milwaukee, in the Mariner Tower, 606 West Wisconsin Avenue, in charge of Chester M. Kuhns, who formerly represented the Youngstown Sheet & Tube Co. in Milwaukee.





Automatic Optical Pyrometer Records Temperatures of Materials in Motion

IN developing the automatic optical pyrometer, Optimatic, illustrated below, the Minneapolis Honeywell Regulator Co. and its affiliate, the Brown Instrument Co., have aimed to meet the practical requirements of industry in respect to the temperature of materials in motion about a steel mill, other metallurgical works, glass plants, etc.

The device is said to indicate or record to full scale the temperature of a hot body in less than one-half second, and to provide that rolling or production operations need not be retarded at any point in the processing of bars, billets, slabs, sheets, rails, rods, tubes, etc.

The device makes possible a permanent temperature record of mill output and prevents accumulation of rejects by revealing faulty processing in early stages.

Emphasis is placed upon convenience in obtaining temperatures of moving objects and of work within furnaces where furnace gases are often detrimental to equipment.

The Optimatic consists of three parts:

1. A water-cooled telescope, or sighting element, that scans the hot body, the temperature of which it is desired to measure. This is spring mounted to a supporting

ring, in order to eliminate all vibrational disturbances.

2. A power supply and amplifier unit, that can be energized from 25 or 60 cycle alternating current, is connected to the sighting element by means of a weatherproof cable.

3. A recorder or indicator, or both, as desired, having standard range of 1200 to 2500 deg. F., or special ones, are wired to the amplifier unit. The speed of chart movement of the recorder is readily

varied and automatically may be shifted instantly from slow to fast or vice versa by the passing of the heated target.

Two photocells, the responsiveness of which varies about as the tenth power of the target temperature changes, are mounted in the optical telescope. One of these is exposed to light emitted by the target surface, the temperature of which is to be measured. The other, through a simple amplifying circuit, is illuminated automatically by a standardized lamp to maintain a relative value of conductivity as the first photocell changes. Hence the current in the standard lamp circuit becomes the measurement of temperature.

Opaque Specimen Surface Illumination

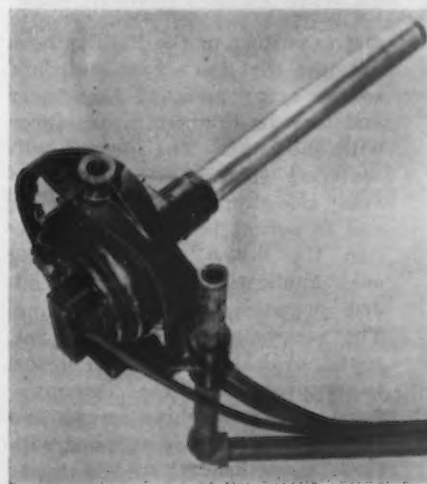
THE difficulty of lighting opaque specimens by means of lights placed above or to one side of the microscope has been overcome by the development of a new Surface Illuminator by Bausch & Lomb Optical Co., Rochester, N. Y., for evenly illuminating either opaque or translucent specimens when examined at low magnifications.

The illuminator illustrated below, gives a well balanced annular cone of light which can be varied both in intensity and incident angle. Objects with irregular surfaces reveal a maximum of detail seldom achieved with ordinary above stage illumination.

The equipment consists of an annular ring holding six bulbs equally spaced around the inside of the ring, with individual reflecting surfaces back of each bulb. The ring slips on over the microscope objective and is held in position by an extension rod suspended from a clamp attached to the eye-piece adapter, which may be either vertical or inclined.

Use can be only with the 48 mm., 32 mm. and 16 mm. microscope objectives. The small bulbs are 2.5 volt, 0.3 amperes, and may be secured in either clear or daylight glass. A transformer with variable resistance and switch for 110-volt, 50 or 60-cycle, a.c. only, is supplied with the illuminator and provides for dimming the light to any degree of intensity. A converter is supplied with d.c. current.

Many lighting effects, each



especially suited to the specimen under examination, may be secured by moving the ring illuminator toward or away from the object. Maximum contrast is thus obtained regardless of the nature of the specimen.

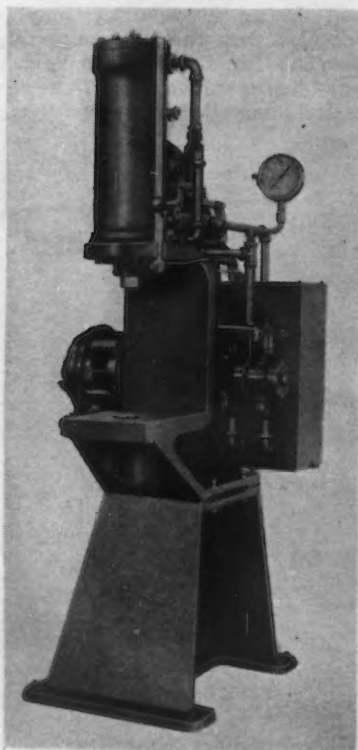
The new illuminator is used either with the standard laboratory microscope, with a body tube diameter of 35 or 39 mm., or with the toolmaker's microscope.

Hydraulic Arbor Press Has Wide Work Ranges

GREENERD ARBOR PRESS CO., Nashua, N. H., announces its new No. 60 self-contained hydraulic press with pressure controls from $\frac{1}{2}$ to 15 tons on the down stroke and from $\frac{1}{2}$ to 13 tons on the up stroke.

The frame and cylinder are constructed of a special semi-steel casting. The piston is made of steel with six cast iron piston rings. The ram gland is packed with chevron-type packings with a bleeder pipe to take care of any seepage plus an extra wiper packing eliminating a seepage of oil on the ram.

The combination low and high-pressure pump is driven by a 3-hp. motor mounted on the side of frame with tank mounted at rear of press. The control valve is either foot or hand operated. Automatic or manual reverse can be made at any



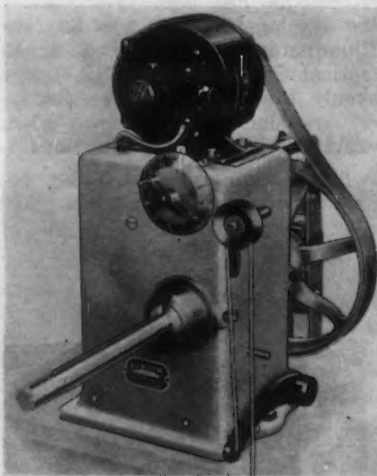
point in either direction. A stop rod also regulates the length of travel in either direction. When the ram is at top position the pump by-passes, relieving all pressure.

The press is particularly adapted to assembly work, push or pull broaching, keyway cutting, and light plastic molding. The 15-ton pressure on the down stroke may be held under even pressure until plastic sets, then released with a 13-ton pull to open the mold. Adjustments are quickly made for the setting of pressure most suitable for different kinds of work up to 15 tons. Operating specifications are given as follows:

Ram travels at the rate of 96 in. per minute under 6 tons pressure; at the rate of 36 in. per minute under 15 tons pressure; 16-in. cycle, no load, in 15 sec.; 6 tons on 16-in. stroke, in 10 sec.; 15 tons on 16-in. stroke, in 26 sec. Height over table 16 in. Receives diameters up to 18 in. Size of work table 12 x 12 in. with $3\frac{1}{2}$ in. cored hole.

Small Hole Grinder For Hand-Fed Work Pieces

THE Sunnen Model "L" grinder, shown below is employed in sizing and accurately finishing small holes with a tapping effect, which

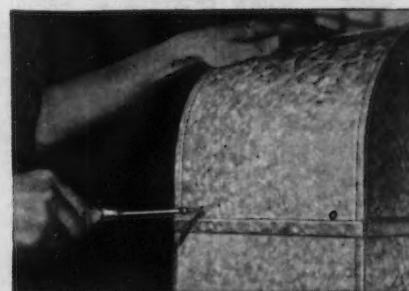
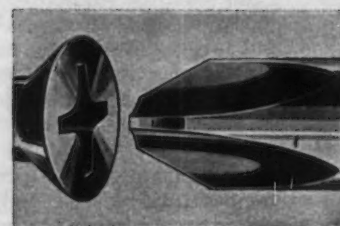
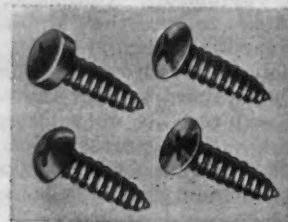


avoids impregnation of the ground surface. The equipment is built by Sunnen Products Co., 7900 Manchester Avenue, St. Louis, Mo.

Duplication of work is attained through settings on the dial of a micrometer stop having .0001-in. graduations. Operator's hands are free for work handling in sliding the work piece on a mandrel which carries the grinding stone, as mandrel revolutions and stone feed are actuated by a foot treadle.

New Design Screw Head Speeds Assembly Work

AMERICAN Screw Co., Providence, R. I., announces a line of case-hardened sheet metal screws featuring a new "Phillips" recessed, self-centering head in place of the conventional screw-slot. Four sizes of drivers or bits cover the range of screw sizes; two drivers cover the range of popular sizes. The drivers may be



for power or manual use. The geometric pattern of the Phillips head provides that the screw shall hold to the taper point of the driver and may be brought into position with one hand. The tapered self-centering feature is said to prevent side-slipping by the driver and to permit the driver to direct the screw while providing easy application of resultant added pressure to screw turning. The screws are made with flat, round, oval and low flister heads. Other products of the company—wood screws, machine screws and stove bolts—are also supplied with the Phillips head.

Multi-Wash Dust Collector

MULTI-WASH dust collectors, as offered by Claude B. Schneible, 4755 North Crawford Avenue, Chicago, have recently been introduced into the foundry industry as a method for eliminating the dust hazard. This collector consists of a large tower in which is located a series of impingement



plates, one above the other, the tower diameter and number of impingement plates depending on the percentage of contamination and the volume of air to be washed. The design provides for complete elimination of moving parts, spray nozzles, pockets or dead zones and allows for using water or any other liquid medium for air cleansing.

Contaminated air is introduced into the tower below the bottom impingement plate, at a tangent to the tower periphery. Water or other cleansing medium, introduced at the top of the tower, falls in a series of sprays from plate to plate, effecting two washings of the rising air, one under and one over each plate. The air continuing upward is caused to spiral, effecting a scrubbing, due to the initial pressure and to the curved vanes located below each of the impingement plates. Twice washed at each plate, the air is thoroughly cleansed after passing over the six plates in a standard tower.

The cone of the collector acts as a wet cyclone, collecting at that point all of the heavy dust particles. Minute particles of dust not collected here rise with the air to the impingement plates and are caught

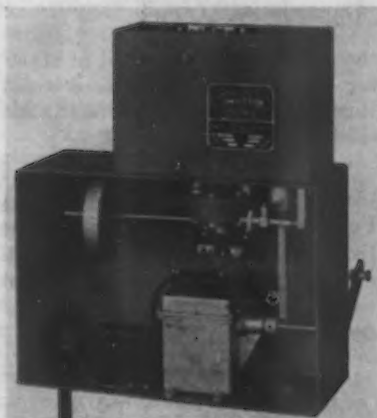
in the high velocity impingement spray. They are then washed back and settle into the cone with the heavy dust.

The small amount of washing liquid required in a multi-wash collector—3 gal. for each 1000 cu. ft. of air—is due to the constant reuse of the liquid.

Schneible multi-wash dust collectors are also available for removing hot gases and dust from the air in cyaniding, carburizing, heat treating or other operations where noxious fumes are created.

Electrical Control of Steam Boiler Combustion

A STEAM boiler combustion control device which is completely electrical in operation and which is designed for use with alternating current is being marketed by Shallcross Controls, Inc., Milwaukee. The device maintains uniform steam pressure, the desired ratio of air to fuel whether coal, oil or gas, and is applicable to any



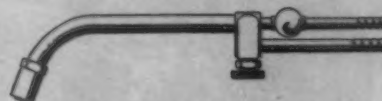
type of stoker. Pressures controlled are from 25 to 400 lb. per sq. in.

All parts are rugged and motor drives are self-contained and sealed in oil. Switch contacts are made of a hard, non-corroding, non-freezing alloy. All parts are made either of non-corroding metal or are rust-proofed. The unit is inclosed in a dust-tight case.

Where there are batteries of boilers a control is placed on each boiler, there being no interconnections between the controls except that when the plant load changes each control will cause its boiler to take its predetermined share of the total load. Or, any of the boilers in a battery can be made to carry uniform loads and the remainder of the boilers will then take the swings. Inclosed push-button switches can be furnished for manual control of either the air damper or fuel feed.

Natural Gas Torch For Production Work

AN air-gas torch, especially designed for use with natural gas, is announced by Torit Mfg. Co., St. Paul, Minn. The advantages said to be gained through the use of the equipment involve design features which eliminate difficulties due to variation in gas quality, either natural or coal gases. The operation of both air and gas valves is by a single lever in the automatic type of torch, which is said to be a high production device.



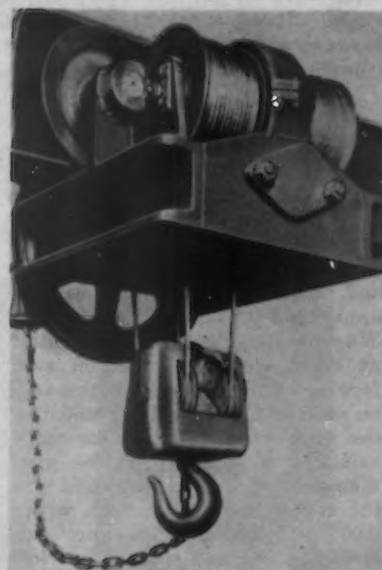
tages said to be gained through the use of the equipment involve design features which eliminate difficulties due to variation in gas quality, either natural or coal gases. The operation of both air and gas valves is by a single lever in the automatic type of torch, which is said to be a high production device.

High Hook Lift For Hand Trolley Hoist

SHAW-BOX CRANE & HOIST CO., Muskegon, Mich., has developed the hand-operated trolley hoist illustrated below.

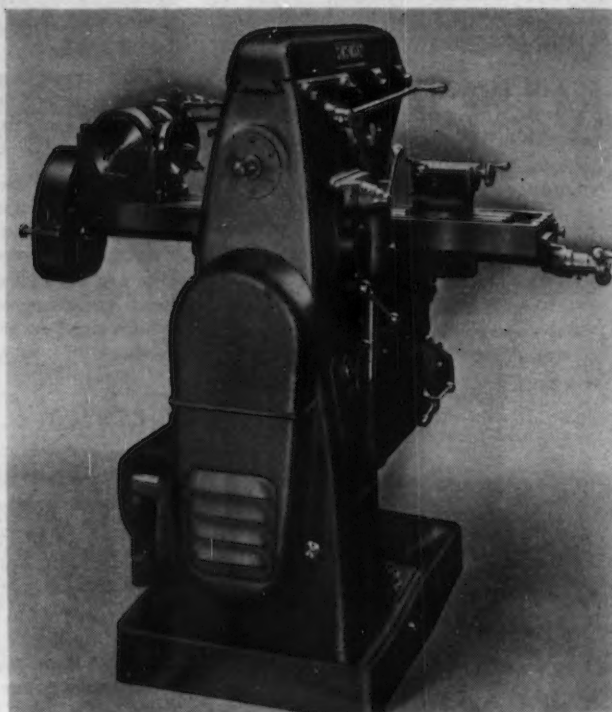
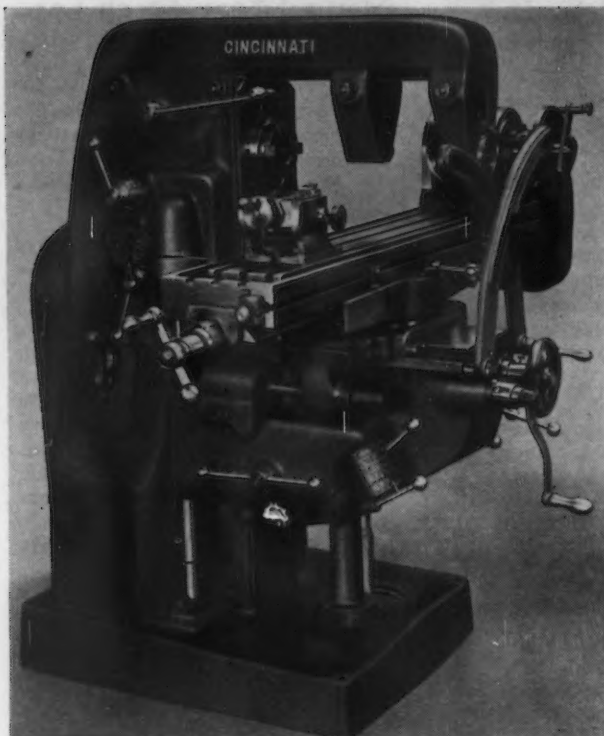
The design contemplates use as a hoisting unit on the company's single girder cranes or for overhead I-beam monorail systems.

High hook lift features all sizes; on the two-ton hoist, the hook in its highest position is 9 1/2 in. be-



low the track upon which it operates; the distance is less on hoists of smaller capacity.

Hoisting is done by a steel cable and drum, the design eliminating pocket wheel and chain and tail chain. The frame is of one-piece welded construction.



Cincinnati Universal Miller for Job-Work

AN L-type, No. 2, universal miller, for job-shop quantities of average milling machine work, is a new toolroom equipment brought out by Cincinnati Milling Machine & Cincinnati Grinders, Inc. Fifteen spindle speeds, arranged in approximate geometrical progression, cover from 23 to 1200 r.p.m. Speed selection is by two convenient levers at the left of the column. Multiple disk brake stops

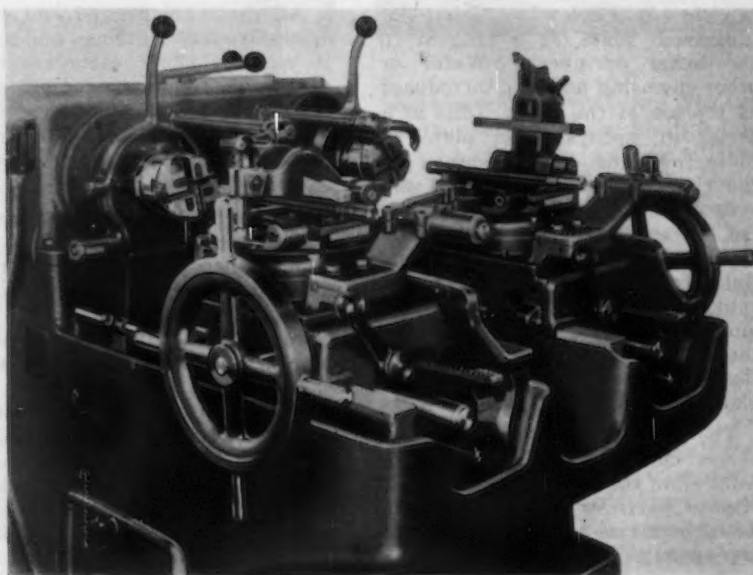
the spindle upon throwout of starting lever. Feed rates are selected through levers at the left hand side of the knee.

Twelve feeds give longitudinal travel from $\frac{3}{4}$ to 30 in. per min. Feeds may be engaged from either front or rear at any stage of spindle operation. Power rapid traverse is available in six directions, the longitudinal travel being at the

rate of 100 in. per min. Release of the rapid traverse lever reduces the motion of the unit to a feed rate. Reversal of spindle rotation is by lever on the side of the column and provides complete control of the motor, eliminating reversing gears. A 3-hp. motor, inclosed in the column, drives the machine through V-belts. Belt stretch is taken up by adjustment of hinged motor base. Convenient accessibility to motor and mounting is by means of a hinged cover at the rear of the column.

Threading Attachment for Double-End Work

A WORK alining fixture which involves an automatic indexing feature for the production of parts which have a thread on each end, required to be concentric, is announced by Landis Machine Co., Waynesboro, Pa. The illustration at right is of a set-up on steel forgings 15 in. long, and threaded on each end $1\frac{1}{4}$ in. It is said that the attachment provides for maintaining concentricity of the pitch diameters of both threads and with the center line of the work within 0.005 in. The forgings are centered, turned and ground previous to the threading operations. Upon completion of first threading the carriage is withdrawn by means of a handwheel. The movement automatically indexes the fixture 180 deg. The equipment is for use on the standard threading machines manufactured by the company, and is applicable to a wide range of production work.



PERSONALS

DAVID F. AUSTIN, who since 1933 has been manager of sales, Pittsburgh district, Carnegie Steel Co., has been appointed manager of sales for the Chicago district, Carnegie-Illinois Steel Corp. He began his career with the United States Steel Corp. in 1918 with the Federal Ship Building Co. His association with the Carnegie company started about eight years ago, during which period he held, successively, the positions of assistant manager of sales and manager of sales of the Cincinnati district office, before being transferred to Pittsburgh.

T. LANE WATSON has been appointed manager of sales of the Western area, bar, strip and semi-finished materials division, with offices at Chicago. He entered the service of Carnegie Steel Co. in 1910 in the general sales department, rail and billet bureau. He was appointed assistant manager, bar, strip and semi-finished division on Nov. 1, 1932, and assistant manager of the Cleveland district on April 1, 1935.

LESLIE B. WORTHINGTON has been made manager of sales for St. Paul district. He entered the employ of the Illinois Steel Co. after being graduated from the University of Illinois in 1923. After serving his apprenticeship at the South Chicago works, he entered the general sales department, where he was employed in various capacities until June, 1935, when he was appointed assistant manager of sales for the Chicago district.

CHARLES A. FITZ GERALD has been appointed resident sales man-

ager for Sloss-Sheffield Steel & Iron Co. in the Chicago territory, which embraces the States of Michigan, Wisconsin, Minnesota, North Illinois and Indiana. For more than 20 years Mr. Fitzgerald has been in charge of pig iron sales in the St. Louis territory and will continue as head of the organization there. His promotion now gives him supervision of both Chicago and St. Louis. He is a native of Alabama and has been with Sloss-Sheffield company since 1904.

JEROME STRAUSS has been elected vice-president in charge of research and development, with offices at Bridgeville, Pa., of the Vanadium Corp. of America.

C. F. BURGESS has been made chairman of the board of the C. F. Burgess Laboratories, Inc., Madison, Wis. ARBA B. MARVIN, one of the organizers of the company and its attorney for more than 20 years, has been elected president.

H. ROBERT SWANSON, who has been vice-president of Alco Products, Inc., primarily in charge of engineering, since its formation in 1930, has been made vice-president in charge of sales and engineering. KIRBY K. WYATT, for the past six years general manager of the Silica Products Co., Kansas City, has become general manager of the Alco company. JOHN H. ERTER, since 1931 contract engineer of the company, has been promoted to the position of assistant general manager.

HERSCHEL V. BEASLEY, formerly identified with the Delco-Remy division of General Motors Corp., the Estate Stove Co., and the Centre Foundry & Machine Co., has been added to the technical staff of the International Nickel Co. He will make his headquarters in the New York office and will handle problems involving the production and application of alloy cast irons.

OTTO DE LORENZI, who has been identified with the Combustion Engineering Co., New York, since 1916 in various engineering capacities, has been appointed assistant general sales manager. He is a graduate of Cornell University.

EUGENE D. MILENER, for the past seven years a member of the staff of the American Gas Association, has been made secretary of the industrial gas section, succeeding C. W. Berghorn, who has resigned to become executive secretary of the Association of Gas Appliance and Equipment Manufacturers.

C. J. DAY has been appointed general sales manager of the National Cast Iron Pipe Co., Birmingham, a division of James B. Clow & Son, Chicago. He fills the vacancy caused by the death of Paul Ivy, Sr. Mr. Day has been with the company for many years and is assistant secretary-treasurer. He will continue in that capacity. PAUL IVY, JR., has been appointed assistant general sales manager. WILLIAM J. LYMAN has rejoined the sales department after an absence of two years.

ARTHUR A. ARANSON, heretofore assistant manager of purchases for the International Harvester Co.,



D. F. AUSTIN



T. L. WATSON



L. B. WORTHINGTON



C. A. FITZ GERALD

has been appointed assistant to F. B. Hufnagel, president of the Crucible Steel Co. of America. For the past 30 years Mr. Aranson has been associated with the Harvester company, which he joined in 1906 at the age of 21 years. Working his way through the ranks, he has been identified with various important positions in the Harvester company where he was in charge of selection and purchase of the types of steel used by the implement industry.

EDMUND BURKE, since 1921 in charge of sales to the oil and gas industries for the Crane Co., Chicago, has been made manager of industrial sales. He joined the company in 1910 as sales engineer and three years later he was made manager of sales of specialties. W. HOWARD PAPE, who succeeds Mr. Burke as manager of sales to the oil and gas industries, has been associated with the industry since 1914 in the capacity of designing, operating and sales engineer. He became identified with the Crane organization in 1927 as special representative in the New York and, later, the Boston territories. During the past six years he has been in charge of oil sales work in the Mid Continent and Gulf Coast areas.

V. A. DODDS, who has been identified with the sales department of the Brown-Wales Co., Boston, for over 16 years, has been appointed manager of sales. He was born in Boston and is a graduate of Boston University.

GARRETT CONNORS has been appointed assistant general manager of the Youngstown Pressed Steel Co., Warren, Ohio. C. A. MORROW is executive vice-president and gen-

eral manager. Mr. Connors formerly was vice-president and director of purchases of the Truscon Steel Co., Youngstown. J. W. FARRELL has been made general manager of sales, succeeding J. B. MONTGOMERY, who has resigned. Mr. Farrell has been assistant general manager of sales. FRANK KNECHT has been named as his assistant and also will have charge of sales promotion work and advertising.

A. S. KELLER, formerly Pittsburgh district representative for the Chicago Tubing & Braiding Co., Maywood, Ill., has been promoted to the position of Eastern sales manager, with offices at 7 Dey Street, New York. A. M. YOUNGER has succeeded Mr. Keller in the Pittsburgh district, though Mr. Keller, as Eastern sales manager, will maintain supervision over the Pittsburgh territory.

DARWIN S. LUNTZ, president of the Luntz Iron & Steel Co., Canton, and a member of the national board of the Institute of Scrap Iron and Steel, has been reelected president of the Canton Chamber of Commerce.

JOHN E. NELSON, manager of Northern ore mines for Republic Steel Corp., has been appointed manager of the combined Republic mines and the mining properties formerly owned by the Corrigan, McKinney Steel Co. He became associated with the Republic Iron & Steel Co. in 1899. He will have his headquarters in Duluth, Minn. MURRAY REDELL, who was in charge of the Corrigan, McKinney mines, will be Mr. Nelson's assistant.

WILLIAM E. RUTZ, plant manager of the Giddings & Lewis Machine

Tool Co., Fond du Lac, Wis., has been elected president of the Fond du Lac Association of Commerce.

J. SETON GRAY has been elected president of the Unit Holding Corp., Milwaukee, formed as the result of the reorganization of the old Unit Corp. of America. He also has been elected president of the old holding company's three operating subsidiaries, namely, Fuller Mfg. Co., transmissions, Kalamazoo, Mich.; the Unit Drop Forge, Inc., and Universal Power Shovel Co., West Allis, Wis. Mr. Gray served as receiver in the four reorganizations.

BRUNO V. E. NORDBERG, executive engineer of the Nordberg Mfg. Co., Milwaukee, has been elected president of the Engineers Society, of Milwaukee. HUGO W. ROHDE Joseph Schlitz Brewing Co., was elected vice-president, and WALTER R. MOELLER, sales engineer, was reelected secretary-treasurer. K. L. HANSEN, Harnischfeger Corp., and L. F. SEYBOLD, research engineer, Milwaukee Electric Railway & Light Co., Milwaukee, and W. A. PIERCE, J. I. Case Co., Racine, Wis., were elected directors for three-year terms.

E. Q. SYLVESTER has been appointed representative for A. Milne & Co. and the Edgar Allen Steel Co., Inc., in the sale of all their products, including alloy steels made by the Carnegie-Illinois Steel Corp., in western Massachusetts, Connecticut and eastern New York. M. F. GETTINGS has been appointed representative in the metropolitan district of New York and New Jersey for tool steels and drill steels handled by A. Milne & Co. and the Edgar Allen company.



A. A. ARANSON



E. BURKE



W. H. PAPE



V. A. DODDS

C. E. MCARTHUR has been elected general sales manager of the Western Machine Tool Works, Holland, Mich. He was formerly secretary and sales manager of the Modern Tool Co. and later with the Consolidated Machine Tool Corp. of America, after the Modern Tool Co. was merged with this corporation.

P. M. MAHLER, president of the company of the same name, New York, is scheduled to sail for South America on behalf of a number of companies he represents. Among them are the Onsrud Machine Works Co., Covell-Hanchett Co., and Cincinnati Electrical Tool Co.

WILLIS C. GOODALE, for many years assistant works manager of the Underwood Elliott Fisher Typewriter Co., Hartford, Conn., has resigned.

DR. BERNARD GOERG has been appointed director of the Institute of Thermal Research of the American Radiator Co., Yonkers, N. Y., effective Oct. 15.

WILLIAM A. ANDERSON has been appointed Pittsburgh district industrial engineer of the Carnegie-Illinois Steel Corp., Pittsburgh, and George A. Whitehurst has been made Chicago district industrial engineer.

N. H. ORR, until recently identified with the American Iron and Steel Institute, has been named general manager of sales of the Colorado Fuel & Iron Co., Denver, Col. His appointment and the opening of a Chicago office represent an expansion in the company's sales activities which were curtailed during the depression.

FRANK J. KENNEDY, former master mechanic of the Mystic Iron Works, Boston, and more recently in charge of pig machine practice at the Sloss-Sheffield Steel & Iron Co., has been made pig iron expert of the E. & G. Brooke Iron Co., Birdsboro, Pa.

W. D. MOORE, president of the American Cast Iron Pipe Co., has been elected president of the Birmingham Kiwanis Club.

THOMAS G. JOHNSTON, superintendent of the Bessemer, Ala., plant of the United States Pipe & Foundry Co., has resigned to go with the southern division of the

Republic Steel Corp. as traveling metallurgist. Mr. Johnston has been with Pipe company for 26 years and has been superintendent since 1921. He has been succeeded by LEWIS E. LING, assistant superintendent for the past 10 years.

C. E. KENDALL, who has been manager of fence sales, Pittsburgh Steel Co., Pittsburgh, since May, 1930, has been appointed manager of merchants' products sales. He became associated with the company in the Chicago office in 1919 and was assistant manager there from 1923 until he became assistant manager of the fence department at Pittsburgh in 1928.

FRANK J. REIF, purchasing agent for the Chicago district for the Carnegie-Illinois Steel Corp., has also been appointed general purchasing agent for the Universal Atlas Cement Co. Mr. Reif succeeds W. H. DUTCHER, who has been with the Cement company for more than 30 years.

J. D. AGNEW, who is connected with the roll sales department of Aetna Standard Engineering Co., Youngstown, Ohio, has tendered his resignation, effective Oct. 31.

J. N. BAUMAN has been elected vice-president in charge of sales of the White Motor Co., Cleveland. This advancement follows his appointment three months ago as general sales manager. He started with the company in 1923 as sales apprentice. FRANK M. BENDER has been elected vice-president in charge of operations. He has been vice-president and general manager

of Lycoming Mfg. Co., Williamsport, Pa. T. R. DAHL has resigned as vice-president and secretary. He has been succeeded as secretary by W. S. SEARLES, who has been assistant secretary.

ROBERT NOTVEST, welding engineer of the J. D. Adams Co., Indianapolis, conducted the first lecture of the second annual fall course of the Milwaukee chapter, American Society for Metals, at Marquette University on Oct. 21. The topic was "Arc Welding as a Fabrication Tool." PROF. J. E. SCHOEN is conducting the course.

HOWARD J. KAIGHIN, formerly works manager of Steel & Tubes, Inc., Cleveland, has been appointed vice-president and general manager of the Standard Tube Co., Detroit.

WILLIAM FREDERICK DURAND, professor emeritus of mechanical engineering at Stanford University, has been awarded the John Fritz gold medal for 1936 for "notable achievement as authority in hydrodynamic and aerodynamic science, and in its practical application; outstanding leader in research and in engineering education." Doctor Durand is a past president of the American Society of Mechanical Engineers.

GEORGE H. SPENCE, formerly identified with the Brown & Sharpe Mfg. Co., and more recently Cleveland district sales manager for Bliss & Laughlin, Inc., has been appointed to represent the Carpenter Steel Co., Reading, Pa., in Cincinnati and southwestern Ohio.

BENJAMIN F. FAIRLESS, president Carnegie-Illinois Steel Corp., was honored at a luncheon given by the Chamber of Commerce at Pittsburgh on Nov. 4. A. W. ROBERTSON, chairman Westinghouse Electric & Mfg. Co., was the principal speaker.

MACGILVRAY SHIRAS has been made director of raw materials of the Carnegie-Illinois Steel Corp., Pittsburgh.

JOHN P. BANKSON, for the past five years identified with the Cleveland district sales office of the Harbison-Walker Refractories Co., Pittsburgh, has been appointed Pittsburgh district sales manager. He is a graduate of Yale University.



N. H. ORR



THIS WEEK IN WASHINGTON

President tries to find out why payrolls are not increasing as fast as production seems to be. Personal conference with business leaders planned.

o o o

Blue pencil being used on next year's budget.

o o o

Administration of Guffey-Synder act promises stricter regimentation than was possible under NRA.

o o o

Steel tubular and firebox boiler industry seeks trade practice rules from Federal Trade Commission.

o o o

Rural electrification wire requirements expected to be large.

BY L. W. MOFFETT

*Resident Washington Editor,
The Iron Age*

WASHINGTON, Nov. 5.—Industry is being called upon by the President to tell him why employment and payrolls are not increasing as rapidly as is production. . . . The problem is worrying the Administration. . . . In order to find a solution which, he said, so far has not been forthcoming, the President said last Wednesday before departing for Hyde Park, that he is conferring individually with industrialists. . . . The Administration still has in mind its originally announced purpose of the works-relief effort to reemploy 7,000,000, one-half to be engaged on Government projects and the other half to be absorbed in private industry. . . . The so-called projects, of course, include a vast amount of boondoggling. . . .

Nevertheless, the President maintained that the Government is quickly nearing completion of its task. . . . Private industry, however, Mr. Roosevelt declared, is lagging behind, despite the gain it is making in production. . . . To support his contention as to the situation in private industry, the President directed attention to a business chart. . . . It showed production to be 90 per cent of a fixed normal average. . . . Employment was shown to be 82 per cent and payrolls only 74 per cent of this average. . . . Should these lines continue to be so far apart there is no question where we are going,

the President ominously declared. . . . The picture the President painted, having been done in dark tones, was in sharp contrast to the one he held up to the country when he returned from his sea trip. . . . On the latter occasion he assured the country that it is well on the road to recovery and urged the people not to let anyone tell them different. . . .

Different subordinates of the Administration have openly charged that private industry is not cooperating with the Government in an endeavor to solve the unemployment problem. . . . The President did not strike that key. . . . It is plainly his earnest hope, however, that the conferences he is holding with industrialists will, by some unannounced means, develop a plan to bring up the employment and payroll lines in keeping with the production curve. . . . He stated that the conferences have no connection with forthcoming NRA discussions of management and labor asked by Maj. George L.

Berry, NRA coordinator for industrial relations. . . . There are, nevertheless, persistent contentions that the conferences are related to the move to set up a strengthened and permanent NRA. . . . For whatever it is worth it was pointed out that the President's remarks on the employment-payroll situation were made two days after holding a long conference at the White House with Major Berry. . . .

The fact remains that Government indices themselves do not support any implication that might be made that the lag in employment and payrolls is due to the killing of NRA. . . . Like production, they have gained since the Supreme Court decision in the Schechter case. . . . Some Government officials also give recognition to the fact that there is no fixed relationship that would develop as rapid a rise in employment and payrolls as in production . . . and the opposite is true, as was shown during the depth of the depression when industry maintained larger

payrolls and employment than actual business conditions warranted. . . . Moreover, the index on production is misleading. . . . Its high level has accounted for production in non-durable goods-producing industries, which, according to the Bureau of Labor Statistics, in September was 97 per cent of the 1923-1927 average, while in the durable goods industries the index was only 71.2. . . . It is in the durable goods industries, gaining though they are, where the largest unemployment still prevails. . . . And many are confident that were confidence returned, say by a tremendous slash in Government expenditures and by balancing the budget, investment in securities would be more attractive and offer a marked surge forward toward recovery. . . .

The matter of the great advance in further technological development, as strikingly reflected in the Cleveland machine tool exposition, of course, has been taken into account. . . . Technological improvement, economists have pointed out, has been stimulated as a matter of necessity for cutting down costs of labor which were brought to a higher level by NRA codes. . . . That the major industries are in accord with the principle of higher wages and shorter hours, within reason, is shown by the fact that they are adhering to or even exceeding code wages and hours with little or no deviation. . . . It is realized that, temporarily, improved machinery may replace labor, but that in the long run it increases not only output and the standard of products, but also employment, by lowering costs and increasing markets and services. . . . And it is the firm conviction of industry that it is in this direction that recovery lies rather than in a return to the horse and buggy days. . . . The return, too, it is held, will be faster if there is less Government restriction, more private initiative, and sounder Federal financing. . . . Incidentally, the President has made it known that he is using the blue pencil on the 1936-37 budget and the result of any real pruning that may be under way will be awaited by the country with keen interest. . . .

Guffey-Snyder Regimentation Gets Under Way

Becoming effective last Friday, the Coal Conservation (Guffey-Snyder) act regiments industries and service organizations of the country so far as Federal contracts are concerned almost as thoroughly as the NRA did when at the height of its power. Actually, the Guffey-Snyder act, the so-called lit-

tle NRA for the bituminous coal industry, exceeds the power which was once exercised by the National Recovery Administration. For, under a ruling of the National Bituminous Coal Commission, railroads, telephone and telegraph companies, which were not under the control of NRA, are regimented by the Guffey-Snyder act.

The ruling has been interpreted to require that all concerns, in order to get Federal Government contracts, whether for service or to supply materials of any kind, must be members of the newly set-up coal code, if they own coal mines, or purchase coal from code members.

In the case of steel companies it is mandatory that those owning captive mines must be members of the code or they will be refused contracts to supply the Government with steel. Steel companies not owning coal mines must have purchased and purchase bituminous coal from code members before they will be granted Government contracts. Railroads carrying mails, if they own coal mines, must sign the code before they will be given Government contracts. Railroads buying coal must purchase it from code members. Coal already on hand must have been purchased by producers who have signed the code. The same is true with respect to all other concerns seeking Government business.

To a degree the ruling effectuates the purposes of the Walsh bill, which failed of passage at the recent session of Congress. This measure required maintenance of code wages and hours before the Government would award contracts to bidders. It would apply to all operations and not only to the production or purchase of coal, as does the Guffey-Snyder act. The Walsh bill was sponsored by organized labor. The Guffey-Snyder act was sponsored by both the United Mine Workers of America and a large section of the bituminous coal industry, although some important units of the industry are holding out against signing the code.

The ruling of the Coal Commission, published in THE IRON AGE of Oct. 31, page 43, has been given an even broader interpretation than that placed on it at that time. It has been amplified by the statement of H. J. Hunt, acting general counsel for the commission, that in his opinion railroads holding mail contracts and other holders of Government contracts, also may have to buy coal under provisions of the Guffey-Snyder act. That is to say, not only must captive mine owners of coal, including many steel companies, sign the code if they are to get Government busi-

ness, but those who have purchased and purchase coal must have secured and secure requirements from code members. The equivalent of certificates of compliance will be required to prove that the coal has been produced or purchased under the terms laid down.

Complications are bound to arise, aside from the legal attacks already under way against the act. The supposition is that prevailing contracts will not be cancelled in the event the "little" NRA code requirements as to production and purchase of coal used in fulfillment of contracts goes in effect. But as an example of difficulties faced, it is quite conceivable that many concerns supplying the Government with service and materials have on hands stocks of coal purchased from both signers and non-signers of the code and it would be impossible to separate the tonnages.

There is also a question as to what effect the ruling, if enforced, will have on the bituminous coal industry. It has been pointed out that it will inevitably turn consumers to the use of oil and other substitutes for coal. Like those already using such substitutes, they would then escape the provisions of the act.

Meanwhile the setting up of 23 district boards under the new law was completed today with an election of board members in Billings, Mont. The next move will be for the boards to fix prices of coal, which will have to be approved by the Bituminous Coal Commission. Pending that action it was expected that the old code prices would be fixed subject to whatever readjustments may be decided upon. The prediction was made that the fixing of prices will move them to a higher level with resulting higher costs for consumers, who in turn would raise the prices of their materials.

Sales below the fixed prices involve a penalty of 15 per cent of the sales prices at the mines. This is provided by the excise tax provisions of the act, rules and regulations for which were issued last Friday by the Bureau of Internal Revenue. Captive mine prices are to be the same as the prices fixed for commercial mines in the respective regions affected. Producers adhering to the code will receive a drawback of 90 per cent of the 15 per cent excise tax. Those not adhering will be penalized to the full extent of the 15 per cent tax. While the tax went into effect last Friday, collection does not become effective until Jan. 2.

Test of the validity of the act has been well started by President

James Walter Carter of the Carter Coal Co., and already is headed for the Supreme Court of the United States. The Carter case, however, is still before the Supreme Court of the District of Columbia. Justice Jesse C. Adkins has refused to grant a preliminary injunction restraining the Government from collecting the 15 per cent tax. He did, however, grant a temporary injunction preventing stockholders of the Carter Coal Co. from voluntarily complying with the code. The court also required that Mr. Carter post a bond of \$25,000.

Through Attorney William D. Whitney, Mr. Carter, as a legal formality to hasten the case to the Supreme Court of the United States, filed notice of an appeal with the United States Court of Appeal and applied to the Supreme Court of the United States for a writ of certiorari. Justice Adkins, having assumed continued jurisdiction, the case is still before him for the purpose of completing expert testimony.

Decision on the application for a writ of certiorari may be made by the United States Supreme Court by Nov. 11 in the event the Government makes answer by that time. Should it withhold the answer beyond that date decision could not be made before Dec. 9 or 18.

Chief Justice Charles E. Hughes was asked to make an immediate review of the lower court's ruling denying an injunction to prevent collection of the tax. The Chief Justice, however, said that he felt the question was sufficiently important to require a decision for granting or denying the petition by the entire Supreme Court.

Acceptances to the code, according to a statement of the Bituminous Coal Commission Monday, had reached a total of 2540. It was stated that, although the exact tonnage figures represented by these acceptances is not definitely known, estimates based upon figures supplied by the deputy district secretaries indicate that producers claiming 161,206,625 tons production during 1934 have signed the code. It was added that the total is increasing daily.

Hearing on Trade Practice Rules

The Federal Trade Commission has set Nov. 15 as the date for a hearing on proposed trade practice rules for the steel tubular and firebox boiler manufacturing industry. Application for the trade practice conference was made by the Steel Heating Boiler Institute. The proposed rules are broken into two groups in conformity with the

commission's trade practice conference procedure. Group I rules cover practices considered to be unfair methods of competition within the meaning of the Federal Trade Commission Act. Group II rules do not themselves constitute violation of the law, but are considered by the industry to be unethical or otherwise objectionable.

Group I rules proposed by the industry relate to price discrimination, rebates, falsification of invoices, breach of contract, selling below cost, false price quotations, defamation of competitors, payment of gratuities, circulation of threats of suits for infringement of patents, etc., not made in good faith, commercial bribery and misrepresentation through advertising.

Group II rules provide for open price filing, adherence to price lists, invoicing at true selling price; condemn allowance to architects, consulting engineers, etc., to induce specifications of a particular manufacturer; recommend that prices and terms of sale only apply to goods covered by the quotation; condemn secret agreement for non-enforcement of clauses of contracts; condemn making deposits, not to be returned, with architect, etc., for privilege of receiving plans and specifications for purpose of making bid; approve maintenance guarantees with respect to products of industry or guarantees other than those relating to materials and workmanship.

Grade Crossing Elimination Allocations

Further grade-crossing elimination allocations have been announced as follows by the Department of Agriculture:

Indiana, allocation of \$2,985,000 out of total of \$5,111,096; main projects, \$522,500 of WPA and \$132,000 of State funds, grade separation structure, Hammond, on New York Central; \$330,000 grade separation structure, Ft. Wayne, on Pennsylvania and Wabash railroads; \$146,000 of WPA and \$3,000 of State funds, grade separation structure, near Bridgeport, on Pennsylvania; \$172,000, grade separation structure, Highland, on Chesapeake & Ohio and Chicago & Erie; \$165,000, grade separation structure, Dyer, on Chicago Indianapolis & Louisville; \$122,000, grade separation structure, Highland, on Grand Trunk Western; \$201,000, grade separation structure, Gary, on Pennsylvania and Wabash; \$250,000, grade separation structure, Indianapolis, on New York Central; \$115,000, grade separation structure, Lafayette, on Wabash and Lafayette Union; \$180,000, grade separation structure, near Terre Haute, on Pennsylvania.

South Dakota, allocation of \$1,397,500 out of total of \$3,249,086; main projects, \$210,000, relocation, grading, Yankton-Gayville, on Chicago, Millwau-

kee, St. Paul & Pacific, Great Northern and Chicago & North Western; \$115,000, grade separation structure, Huron, on Chicago & North Western.

Vermont, allocation of \$729,857 (total); main projects, \$123,000, elimination two grade crossings by relocation of highway, near Junction, on Rutland railroad; \$112,000, new overpass, near Saint Albans depot, on Central of Vermont.

Utah, allocation of \$308,000, out of total of \$1,230,763; main projects, \$154,000, portion of grade separation structure, near Brigham City, on Oregon Short Line and Utah Idaho Central; \$134,000, grade separation structure, near Salt Lake City, on Denver & Rio Grande Western.

REA Program Involves Wire Requirements

Requirements for 1115 miles of wire for use in electrifying farms are expected to reach mills soon as the result of allotments of \$1,274,084 for 4247 farms, announced on Monday by Administrator Morris L. Cooke of the Rural Electrification Administration. Mr. Cooke said that these projects will be completed soon. He pointed out that REA was set up as a works relief agency and sponsors of electrification projects are required to start construction of lines promptly. Labor is to be engaged from relief rolls wherever possible.

The projects and borrowers announced follow:

Boone County, Ind., \$567,926 for 537 miles; Indiana State-Wide Rural Electric Corp., sponsored by State Farm Bureau.

Rhea County, Tenn., \$38,058 for 38.9 miles; city of Dayton.

Scott's Bluff and Sioux Counties, Neb., \$310,000 for 226.5 miles; Roosevelt Rural Public Power District.

Scott's Bluff County, Neb., \$65,000 for 47 miles; Gering Valley Rural Public Power District.

Miami County, Ohio, \$254,000 for 193 miles; Miami Rural Electric Cooperative, Inc.

Bell County, Tenn., \$33,000 for 30 miles; Bartlett Community Light & Power Co.

Dallas County, Iowa, \$6,100 for three miles; Central Iowa Power Co.

Mr. Cooke said that, in addition to the foregoing, REA has between \$30,000,000 and \$40,000,000 in new power systems under consideration. REA lends money at 3 per cent interest over a period of 20 years.

The George A. Fuller Co., Washington, has been awarded the contract for erection of the Outhwaite housing project in Cleveland. The contract price is \$2,569,975.

New Trade Publications

Contactors. Clark Controller Co., Cleveland, 12-page folder, describing and illustrating line of contactors for spot, flash and projection welding machines. Two types are combined contactors and timers, one is for only extremely short timing and where operation is magnetic and a fourth is only a contactor.

Steam Specialties.—Nason Mfg. Co., 71 Fulton Street, New York. Bound bulletins. Accessories, valves and traps. Systems for condensation problems.

Valves.—Golden-Anderson Valve Specialty Co., Fulton Building, Pittsburgh. Full descriptions, illustrations, line-drawings and tables covering the automatic valves produced by the company for transportation and industrial uses.

Porcelain Steel Business Structures.—Porcelain Steel Buildings Co., 555 West Goodale Street, Columbus, Ohio. A 24-page monograph, illustrated in color, describing business and store buildings constructed according to interchangeable unit principle from steel members and panels manufactured by the company. Buildings may be dismantled, relocated and reassembled at small cost.

Wire Cloth.—Audubon Wire Cloth Corp., Richmond Street and Caster Avenue, Philadelphia. Catalog No. 40, 56 pages, describing and illustrating the company's complete line. Specifications and list prices, together with information for selecting and specifying wire cloth, are included.

Meehanite Iron.—Meehanite Metal Corp., Pittsburgh, has issued bulletin No. 5 of its research institute. Circular compares ordinary cast iron with Meehanite variety, and lists cross-sectional views of semi-steel, cast iron and Meehanite, demonstrating greater tensile strength of latter.

Porcelain Enamel.—Porcelain Enamel Institute, Chicago, has published a booklet entitled, "Sales Manual for Porcelain Enamel." Brochure is profusely illustrated, and describes in non-technical language origin, nature, application, uses, and advantages of porcelain enamel.

Acid-Proof Cement.—United States Stoneware Co., Akron, has released bulletin on quick-setting acid-proof cements for acid-proof tank and tower construction. Uses are cited for such work as pickling and galvanizing tanks, chemical storage tanks, gutters, acid-proof floors, chimneys, etc.

Motor Measurements.—Ford Motor Co. has issued booklet narrating history of science of measurement. Booklet, entitled, "He Measures in Millionths," is by James Sweinhart. Work of Carl Edvard Johansson, identified by Johansson Gage Blocks, is covered.

Rotary Pumps.—George D. Roper Corp., Rockford, Ill., Bulletin R 5, describing line of direct drive rotary pumps for hydraulic power transmission and general purposes.

California Corrugated Culvert Co., Berkeley, Cal., has just been purchased by American Rolling Mill Co. H. W. Force, founder, will continue as managing executive of the new plant.

Blue Print Machines.—Paragon-Revolute Corp., Rochester, N. Y. Booklet. Illustrates and gives details of automatic, continuous blueprinting equipment, including electrically heated finisher.

Ball Bearings.—Fafnir Bearing Co., New Britain, Conn. Bulletin with diagrams of typical layouts and applications to the varied requirements of machine tool spindles. A review of the development of pre-loaded duplex bearings.

Pneumatic Wheel Casters.—Saginaw Stamping & Tool Co., Saginaw, Mich. Bul-

Diesel Engines.—Caterpillar Tractor Co., Peoria, Ill. Booklet. Rotogravure illustrations and short text descriptions in answering a series of Diesel engine questions which avoid technicalities of design.

Belting.—Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., Passaic, N. J. Bulletin. Condor compensated belt. Installation views over wide field. Charts and diagrams of technical data.

Diamond Holders.—J. K. Smit & Sons, Inc., 157 Chambers Street, New York. Bulletin descriptive of "Stay-Kool" industrial

Announcing the Winners of THE IRON AGE'S Modernization Contest

YOU may remember the pictorial story of The Plant That Was Struck By Lightning, which appeared in the Aug. 8 issue of *The Iron Age*. Our readers were invited to supply the words, in the form of stories of modernization, to fit the "theme" that was set by the pictures.

The contest closed on Oct. 12, at midnight. The manuscripts submitted have been gone over carefully by the editors. The winning papers have been selected and checks for the authors' awards will be mailed immediately.

Following are the prize winning contestants:

First prize, \$200.00 to Carl Welin, 4118 South Halsted St., Chicago.

Second prize, \$150.00 to Leslie E. Bryant, 2490 Whitelaw Ave., Cuyahoga Falls, Ohio.

Third prize, \$100.00 to George A. Walker, Cambridge, Mass.

Fourth prize, \$75.00 to Clarence G. Rush, Long Beach, Cal.

Fifth prize, \$50.00 to H. J. Chamberland, 38 John St., Springfield, Mass.

The first prize winner's story, "Lightning Did Strike This Plant" is a true story of wide-scale modernization after a total fire loss. It will appear in our issue of Nov. 28 and our readers are advised to be on the lookout for it.

letin. Description of products, and convenient tables for determining types of casters for replacement use on industrial equipment and trailers.

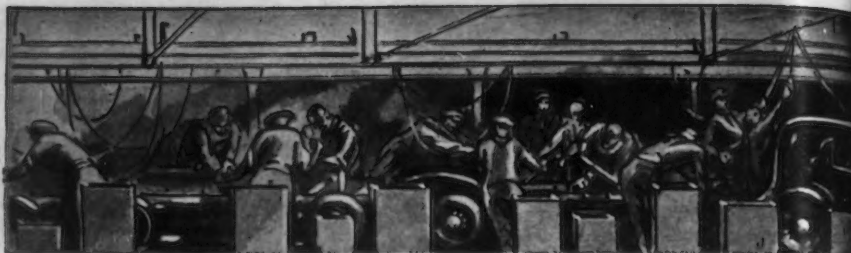
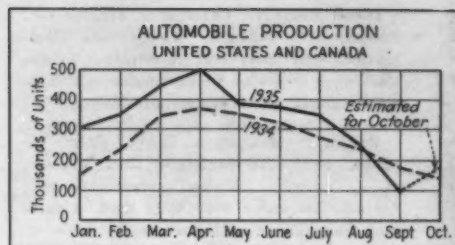
Controllers.—Foxboro Co., Foxboro, Mass. Bulletin No. 202. Illustrative and descriptive of Foxboro potentiometer and resistance thermometer controllers for electrical operation of valves or rheostats to govern oil, gas or electric heat supply.

Friction Materials.—Johns-Manville Co., 22 East Fortieth Street, New York. Brochure catalog. Illustrated applications of industrial friction materials. Condensed tables giving the comparative characteristics of linings, brake blocks and of friction facings.

diamond holders employing water as holder coolant in wet grinding and air in dry grinding.

Portable Drills.—Chicago Pneumatic Tool Co., 6 East Forty-fourth Street, New York. Catalog. Universal electric tools of portable design and for use on stands. Applications, features and specifications of different types for varied purposes. Sectional views showing typical construction, operation and control features.

Drilling Machines.—Adolph Muehlmann, Cincinnati. Bulletin. "Maxi-Jr.," sensitive drilling machines. Description of unit radial swing on column mounting, and of gang applications. Specifications and speed tables.



THIS WEEK ON THE

Car Makers Expect High Production Rate To Hold Through Winter

DETROIT, Nov. 5.

WITH the automobile show holding forth at Grand Central Palace and smaller motor shows at the Astor, Waldorf and Commodore, not to mention the numerous special automobile editions of New York newspapers and special exhibits by dealers, Detroit has pretty much taken over Manhattan this week. The industry's "brass hats" are in a mellow mood as the show circuit around the country turns on the lights for its annual performance, because orders are pouring into southern Michigan factories in huge quantities.

If any of the top executives had a tremor of doubt about the public reception of new cars introduced in the fall, it has been swept aside by the influx of business before the official sales ballyhoo had hardly begun. Dealers have responded by ordering more freely than at the start of any season since the depression struck. And one should remember that dealers don't buy cars unless they are convinced that they can sell them.

Even more heartening is the gay buying mood of the public. The experience of Buick, first of the major companies to present 1936 models, is considered typical of the industry as a whole. In the first 20 days of October it delivered to retail customers almost 9000 cars and in the second 10 days of last month attained the highest sales mark in 4½ years. Now Harlow H. Curttice, Buick's president, comes forth with the statement that "initial orders for the new cars are sufficient to maintain production schedules beyond the first of the year at the

highest rate in many years." He adds that Buick's situation also holds throughout the industry.

November assemblies seem assured of passing 300,000 units by a generous margin and projected schedules for December also call for over 300,000 cars and trucks. In fact, it appears likely that December output will set a new record for that month. January and February are the two months about which everyone has been wondering. It will surprise competent observers, however, if those months show much of a letdown in actual assemblies. Manufacture of parts, of course, will be continued at a steady rate through the entire winter in anticipation of spring requirements.

Steady Production Through Winter

One is fairly safe in saying that unless things suddenly go "haywire" (and nobody anticipates that), motor car assemblies will not fall under 300,000 units in any month from November through next June. The strategy of one of the industry's larger corporations illustrates what may be expected in the months ahead. It purposely allowed dealers' stocks of 1935 cars to dwindle to an average of only one per dealer (some of which were demonstrators) before it started to build 1936 models. If its retail sales the coming winter should be around 10,000 a week, which is not an unreasonable expectancy, it will make 11,000 or 12,000 cars. It thus will gradually fortify its dealers for the inevitable rush of buying next spring.

This corporation is counting on stocks of new cars in the field

reaching the highest point for 1936 about the middle of May. During 1935 the top mark was attained late in June. This program means that production will be steady all winter. It indicates that January and February, far from being a bugaboo, will be healthy operating months.

The industry is mustering its highest-powered arguments to get the public to buy new cars on the verge of winter. Automobile shows are demonstrating equipment used to keep main highways free from ice and snow during severe weather, pointing out that touring is no longer a summer pastime. Why not vacation in winter by driving to Florida, California or the Southwest? Automobile sales departments are busy convincing car owners that old cars are most expensive to maintain and operate in winter. Repair bills mount, tires cause trouble, batteries are prone to get out of order and starting mechanisms are subject to malfunction. With these arguments, plus the contrast of a ride in the Perfection Six as against a drive in the old bus, the army of motor car salesmen expect to capture thousands of customers before Christmas. The industry intends to push a "Buy-a-car-for-Christmas" campaign, being confident that it will bring in plenty of business.

General Motors Expands on West Coast

In spending \$2,500,000 for a plant at Los Angeles in which to assemble Pontiac, Oldsmobile and Buick cars, General Motors is setting up on the Pacific Coast an or-



ASSEMBLY LINE

ganization somewhat similar to its Canadian program. In Canada there are two plants devoted to the building of Chevrolet cars and one at Oshawa where Pontiacs, Oldsmobiles and Buicks are made. Chevrolet already has a plant at Oakland, Cal. The Los Angeles factory, which will be ready April 1 and will employ 1500 men, is the first established away from the home plant in southern Michigan of its car divisions except Chevrolet.

Analysis of the General Motors situation on the Pacific Coast shows that erection of the new assembly plant is a bid for a considerably larger share of the West Coast business. In the first place, the Pacific Coast, with a gain of 61 per cent, has made the biggest increase in passenger car sales over a year ago of all sections in the United States. Secondly, the medium-price divisions of General Motors have had a struggle in California, Oregon and Washington to keep ahead of Chrysler and a plant on the coast will aid dealers in getting quicker deliveries and will give them better service facilities. In the first eight months of 1935 the combined total of passenger car sales by Buick, Olds and Pontiac in the three Pacific Coast states was 21,657 units, as against a total of 20,152 for Dodge, De Soto and Chrysler. The Chrysler strength largely rests in the Dodge division, incidentally.

There are two other factors entering into the decision to expand in the West. One is that the Californians will feel that the three cars to be made at Los Angeles are products of home industries rather than of industries far distant. The other is that the three divisions of General Motors will benefit to some extent from the freight differential in their favor. That is, cars will be sold f.o.b. Pontiac, Lansing or Flint, although assembled at Los Angeles. While many parts will be shipped to the West Coast plant from southern Michigan, neverthe-

BY BURNHAM FINNEY

Detroit Editor, *The Iron Age*

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less the differential pocketed by the factory is considerable.

Initial orders for equipment for 1937 car production have already been placed, with deliveries to start in April. Naturally the heavier machinery which requires a longer time to build has been the first to be purchased. This development breaks all precedents in the automobile industry, because never before have car manufacturers anticipated their needs so many months in advance. At least some members of the industry intend to prepare for 1937 far enough ahead that they won't be plagued with the agonizing production delays so common in Detroit in connection with tooling programs. Moreover, there won't be much chance for

labor organizations to catch them in a bad situation and force a "shot-gun" agreement. When the car companies which have contracted for equipment first said that they intended to buy about this time, equipment builders weren't convinced, having heard such fine promises before. When the orders actually came through, you could have knocked over the astonished equipment people with a feather. It still sounds like a fairy tale, but is true.

The equipment market is perking up considerably. Chevrolet shortly will spend around \$250,000 for presses for its new commercial body plant at Indianapolis. Chrysler is having some special machinery rebuilt, while Chevrolet and Pontiac have asked for bids on machine tools of a specialized nature in an effort to cut costs. Ford is scarcely ever out of the market and at present is studying bids submitted on cost-saving and quality-improving equipment.

Detroit Notes

Chrysler is referring to the molybdenum steel developed by C. Harold Wills as "Amola" steel. It is claimed that this steel, used in Chrysler springs, can be subjected to pressure of 200,000 lb. per sq. in. without the tapered leaf springs losing their arc, losing their springiness, settling or breaking. . . . Auburn is showing at New York a nine-passenger sedan powered by a Cummins Diesel engine. The first of these cars has been sold to American Airlines, Inc. (a Cord-controlled company, as is Auburn) to carry passengers to and from the airport in Chicago. . . . The new Kelsey-Hayes foundry in Detroit is now pouring its first heats. . . . Budd is understood to be making the one-piece steel roof for the 1936 Studebakers. . . . An established car manufacturer, which heretofore has confined its efforts to the market from \$1,000 up, is considering an invasion of the \$750-\$800 market next year. Its plans,

F.O.B. FACTORY PRICES 4-DOOR SEDAN MODELS FOR 1936

	Compared with 1935
Chevrolet Standard Six.	\$575 +25
Ford Standard V-Eight	580 + 5
Plymouth Six	590 +20
Ford De Luxe V-Eight.	625 -10
Chevrolet Master De Luxe Six	640 Same
Plymouth De Luxe Six.	660 Same
LaFayette Six	675
Pontiac Master Six	720 + 5
Dodge Six	735 Same
Nash 400	740
Nash 400 De Luxe	765
Pontiac De Luxe Six	770 + 5
Oldsmobile Six	795 + 5
Pontiac De Luxe Eight	815 -15
Hupmobile Special Six.	855
*Buick Special Eight	885 -10
*Nash Ambassador Eight	885
Hupmobile Custom Six.	930
Oldsmobile Eight	935 - 5

*This year with trunk as standard equipment.

58,402 MEN IN CLEVELAND



Crowds like this continually surrounded the Pratt & Whitney No. 2A High Speed Jig Borer in Cleveland. Twenty-three of these new triple purpose machines, shown there for the first time, are now making comparable records in SPEED and ACCURACY in progressive shops. Eight more are sold and about to be shipped. Only a few are left for quick delivery.

IT WAS NOT A STUNT . . . JUST PART OF THE DAY'S WORK FOR THE P&W No 2A Jig Borer

Our photograph opposite gives you some idea of the beautiful mirror finish the No. 2A Jig Borer left in this hole. It is $3\frac{7}{16}$ " in diameter and $7\frac{3}{4}$ " long. It was precision bored with a feed of .001" and a spindle speed of 450 R.P.M., using a single point boring tool.

It is difficult to visualize from a photograph the mechanical perfection of this hole. It is straight and true throughout its length within .0002", as explored and measured by a P&W Electrolimit Gage. Yet it was just one of the regular demonstrations done on the floor at Cleveland with crowds watching.

There is a twenty-page book describing this new high speed No. 2A Jig Borer and the work it is doing. This book is sent free to interested executives who will request it on their company letterhead. It will enable you to visualize what this machine, new in 1935, could do in your shop. Write for your copy today.

TRIPLE PURPOSE MACHINE

1. Toolroom

For the making of jigs and fixtures the P&W Jig Borer is without equal. Its accuracy, which cannot be affected by wear, has become a byword with tool-makers doing precision boring. They consider this machine essential toolroom equipment.

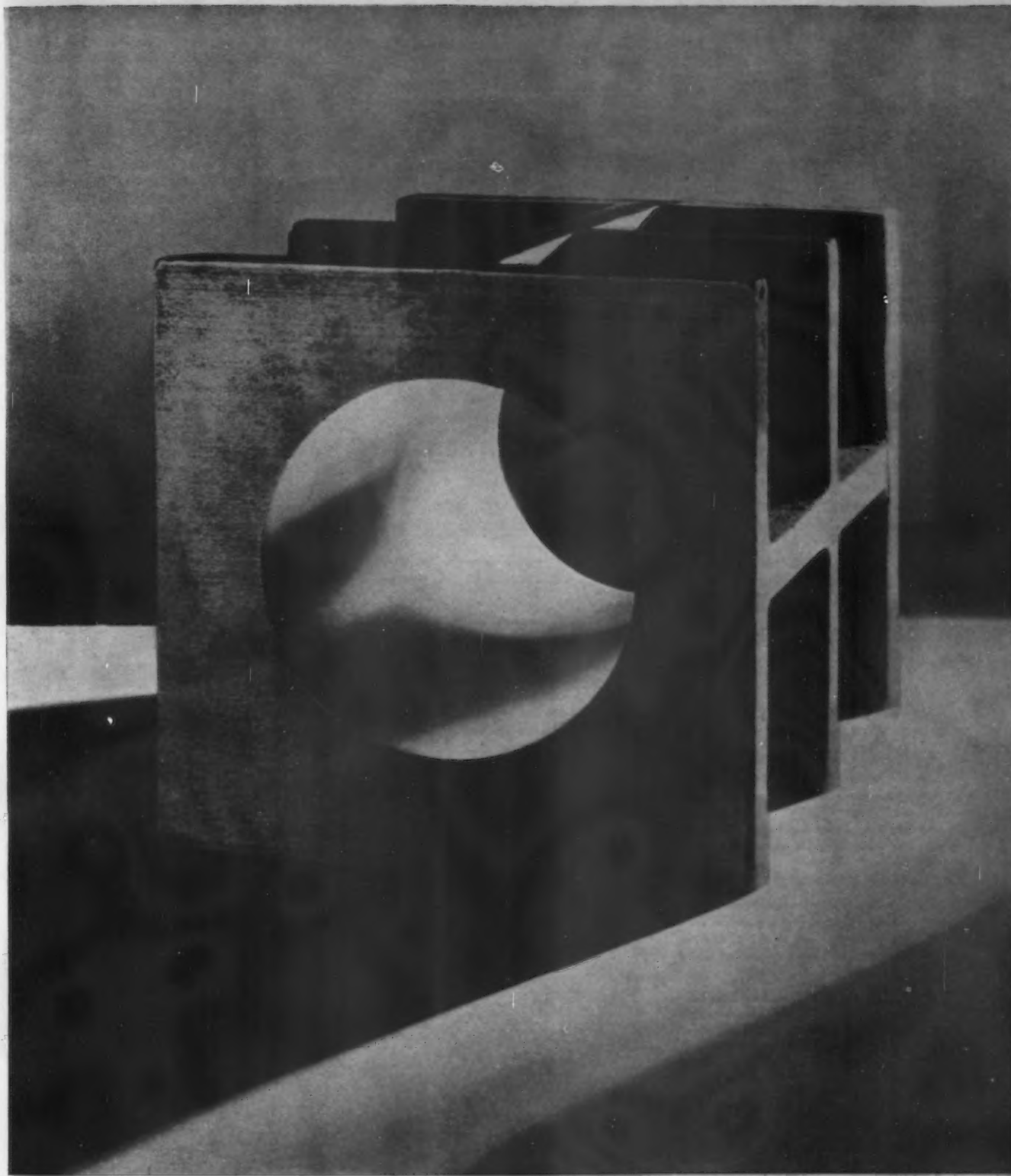
2. Experimental Shop

The shop that must pioneer new models and whittle out jobs without tools swears by the P&W Jig Borer. That beautifully finished hole opposite might have been in an experimental cylinder block. The P&W Jig Borer has become basic equipment in the experimental shop.

3. Production Shop

The P&W Jig Borer also has become a "Jig Eliminator". Instead of building up special tooling for small lot manufacturing, the work itself frequently can be finished entirely on the P&W Jig Borer. It can do drilling, reaming, boring, chamfering and light milling operations, all to fine jig borer accuracy. Many plants have established this machine as a production manufacturing unit on small lots, and have shown forty and fifty per cent savings.

SAW THIS "HOLE" STORY!



PRATT & WHITNEY Co.
HARTFORD, CONN.

however, still are in the speculative stages.

Car manufacturers are talking in big production figures these days. On Oct. 31 Ford made its millionth car for 1935 and announced it probably would build 180,000 cars during November and December. Chevrolet, having turned out around 65,000 units in October, is heading toward 100,000 units this month and the same number in December. Chrysler is said to be pushing up toward a level of 80,000 cars a month.

Facing these heavy schedules, the industry is bearing down on steel mills, particularly those making sheets, to ship just as much tonnage as possible in the next few weeks. Fisher Body, for example, is taking in sheets at its various southern Michigan plants as fast as the mills can deliver them. Ford has bought 20,000 tons of sheets and probably will make further purchases the coming week.

The Lincoln-Zephyr, shown for the first time Saturday in six key cities throughout the country, is priced at \$1,275 for the two-door sedan and \$1,320 for the four-door. This is higher than many people predicted, being \$230 above the Packard One Twenty. Car prices for 1936 are approximately the same as in 1935 in the market under \$1,000.

TRADE NOTES

Ingersoll Milling Machine Co., Rockford, Ill., has appointed Wright & Gade Equipment Co., 3701 North Broad Street, Philadelphia, as agent for Ingersoll cutters in the Philadelphia area, eastern Pennsylvania, southern New Jersey, Delaware, Maryland and Virginia.

O. A. Muenz, 50 Church Street, New York, is now covering metropolitan New York, southeastern New York, southwestern Connecticut, and northern New Jersey for the company.

Harnischfeger Corp., Milwaukee, has concluded manufacturing arrangements with Newton Chambers & Co., Ltd., Sheffield, England, for production of small gasoline Diesel engine powered convertible excavators. Machines will be distributed by Newton Chambers Harnischfeger Engineering Co., Ltd., of which Deane S. Holt, foreign representative of Harnischfeger Corp., will be one of directors. F. P. Breck, who has had many years of shop experience in the Harnischfeger works, has been assigned to British firm to assist in manufacturing Harnischfeger products along established principles.

Kinite Corp., manufacturer of special alloy steel for die blocks, etc., formerly located in Milwaukee, but later at Toledo, Ohio, and Fairmont, W. Va., is transferring the operation to Sheboygan, Wis., due to unsatisfactory labor conditions in West Virginia. The plant has been closed

for five months and when production is resumed in Sheboygan 80 to 90 men will be employed on two shifts.

Link-Belt Co., Chicago, now located at 910 South Michigan Avenue, will move its executive offices about Nov. 30 to 307 North Michigan Avenue.

Mayhew Machine & Engineering Co., 2713 Commerce Street, Dallas, Tex., has been appointed authorized distributor, with a stock consisting of roller chains, sprockets and flexible couplings, for Diamond Chain & Mfg. Co., Indianapolis.

Reeves Pulley Co. Columbus, Ind., manufacturer of variable speed control equipment, recently completed the third addition to its office and factory space since the first of the year. These additions total about 8000 sq. ft. of floor space and were required to relieve congestion and take care adequately of necessary expansion in certain departments.

Binks Mfg. Co., 3114 Carroll Avenue, Chicago, has formed new ceramic engineering service department for the benefit of present and prospective customers. New department offers engineering service to ceramic plants throughout the country to render help and suggestions not only on spray equipment, but on all finishing room problems.

Despatch Oven Co., Minneapolis, has appointed G. A. Webb and A. L. Kershaw district representatives in Detroit-Toledo district and surrounding territory, with offices at 337 Curtis Building, Detroit.

American MonoRail Co. has moved its Philadelphia branch office from 3312 Lancaster to Arch and Thirty-third Streets.

Udylite Co., Detroit, has appointed Scobell Chemical Co., Rochester, N. Y., as distributor for its complete line of plating and polishing supplies and equipment.

Struthers-Wells Co., Warren, Pa., has established an office in the Union Building, 1838 Euclid Avenue, Cleveland, in charge of B. W. Rogers and P. M. Kline.

FINANCIAL NOTES

Doehler Die Casting Co. had net earnings in the nine months ended Sept. 30, after deducting reserves, depreciations, etc., but before providing for Federal income taxes amounting to \$579,388. After deductions net earnings for the period were \$499,345, equal to \$1.95 per share on 206,195 shares of common stock.

Granite City Steel Co., Granite City, Ill., had net profit of \$102,824 in the quarter ended Sept. 30, against a net profit of \$177,792 in the preceding quarter and net loss of \$46,314 in the September quarter of the preceding year. For the nine months ended Sept. 30 the net profit was \$415,198, against net profit of \$153,931 in the same period in 1934.

Rustless Iron Corp. of America, Baltimore, in the nine months ended Sept. 30 had a net profit of \$145,779 before provision for Federal income taxes. Before provisions for depreciation, the company's operating profit was \$190,691, its manufacturing profit \$401,398. Current assets at the close of business Sept. 30 were \$667,955, while total assets were \$1,340,984.

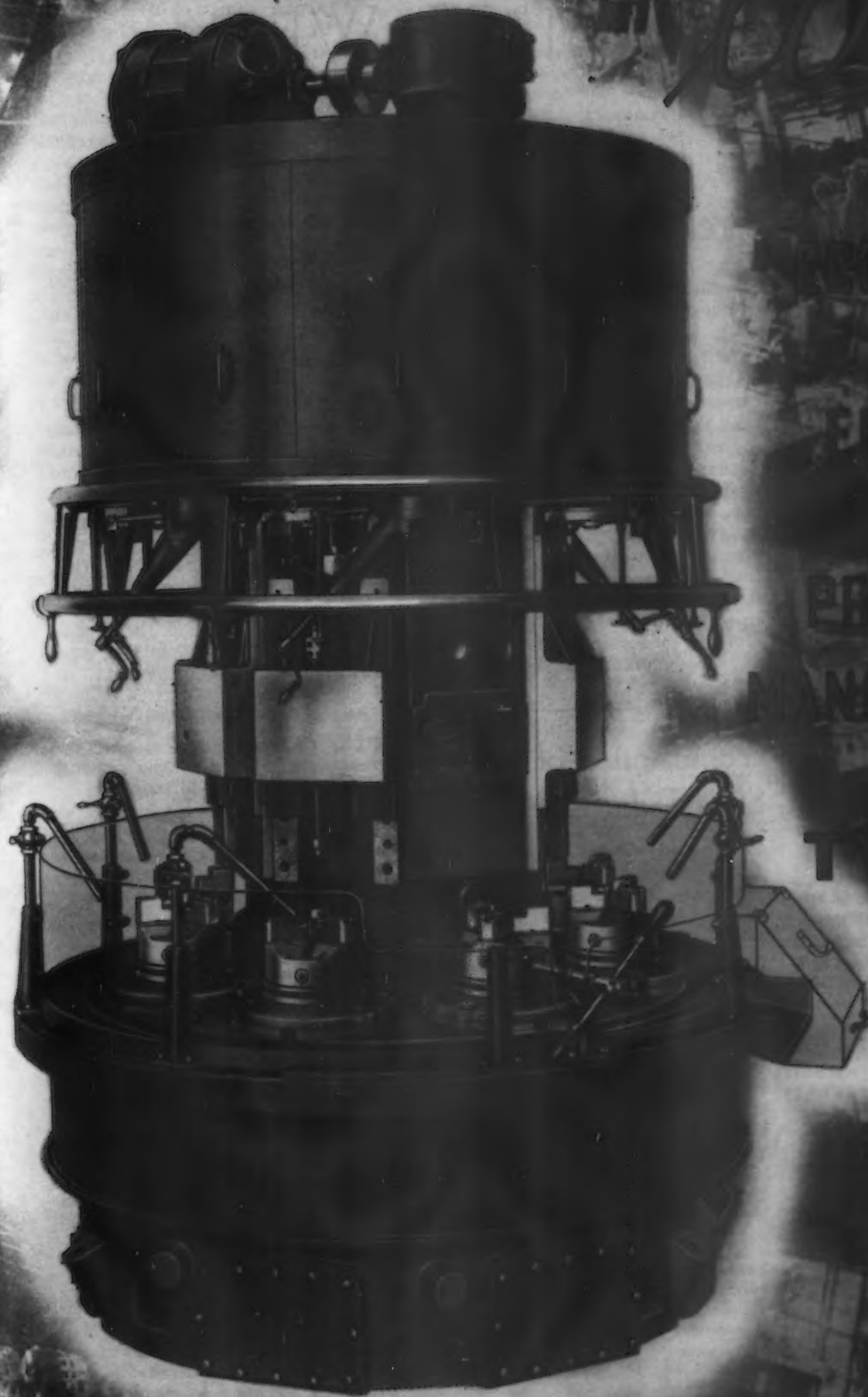
Wheeling Steel Corp. and subsidiary companies, in the third quarter had net profit of \$648,597, compared with \$668,300 in the preceding period, and net loss of \$930,788 in the September quarter last year. Net profit in the first nine months of this year was \$2,251,468, compared with net profit of \$145,390 in the same period last year.

Pittsburgh Screw & Bolt Corp. had net profit in third quarter of \$7,669, compared with net loss of \$715 in the preceding quarter and net profit of \$7,022 in the corresponding period in 1934. For nine months the company had net loss of \$76,263, compared with net profit of \$35,892 in the first nine months last year.



THE V-12 Lincoln-Zephyr, a Lincoln-Ford product and the newest entry in the medium-price field, is offered as "the most completely streamlined car ever put into production." The car comprises a "bridge truss" body, in which the engine is mounted and to which the running gear is attached. The Lincoln-built 12-cylinder engine develops 110 horsepower. Wheelbase is 122 in.; spring base 133 in. Center-poise spring suspension with record low center of gravity gives unusual riding comfort.

Industries Answer



MORE
ECONOMICAL
EFFICIENT
PROFITABLE
MANUFACTURING
TYPE D
MULT-
AN
MACHINE

THE BULLARD COMPANY
BRIDGEPORT CONNECTICUT



NEWS OF THE WEEK

Bethlehem Steel Corpn. Earns 75c. And Pays \$1.75 on Preferred Stock

WITH a net income of \$701,616 for the third quarter, equivalent to 75c. on the preferred stock, Bethlehem Steel Corpn. has declared a \$1.75 dividend, payable Jan. 2 to preferred stockholders of record on Dec. 6. This is the second such dividend this year, and leaves the accumulated dividends on this stock at \$17.50.

For the first time since 1930 Bethlehem showed a profit for the third quarter. The net income of \$701,616 compares with \$1,800,909 in the second quarter and a deficit of \$2,400,126 in the third quarter of 1934. Eugene G. Grace, president, pointed out that the profit in the third quarter would have been considerably larger if it were not for the duplicate interest on refunding bonds temporarily carried on the books. Bethlehem has floated \$55,000,000 in bonds to refund obligations amounting to \$53,000,000 which mature next March and July. At the same time these obligations are refunded, Bethlehem intends to call \$19,000,000 of additional miscellaneous obligations for retirement. Thus the funded debt will be reduced to about \$99,000,000, with quarterly interest of about \$1,175,000, as compared with a current debt which calls for \$1,952,000 quarterly interest.

Bethlehem's operating rate in the third quarter averaged 27.8 per cent, as compared with 38.6 per cent in the previous quarter and 22.8 per cent in the third quarter of 1934. Current steel production is about 46 per cent, and Mr. Grace stated that this production would probably be maintained during the remainder of the quarter. Value of orders now on hand is \$63,576,027, as compared with \$49,589,474 at the end of the second quar-

ter, the rise being attributed solely to naval contracts recently secured.

Mr. Grace stated that Bethlehem will have spent about \$22,000,000 by the end of the year for modernization and expansion of flat-rolled steel capacity. Most of this expenditure is represented in the new Lackawanna continuous mill, scheduled for trial runs early in December, and the new tin plate mill at Sparrows Point, Md., due to go into operation on March 1. The new Lackawanna mill will practically triple Bethlehem's existing flat steel capacity and will give this company a better balance of light and heavy products.

Consumption of Lead Steadily Increasing

AN analysis of the American Bureau of Metal Statistics' September report on refined lead reveals a definite trend toward greater consumption of this metal. In order to facilitate comparisons, the information derived from the report is presented in tabular form.

(1.) Production is well below consumption. Monthly average production for the first nine months of 1935 was 32,902 tons, while shipments averaged 33,937 tons. That this trend is continuing in late months is shown below:

1935	Tons		
	Produc- tion	Ship- ments	Stocks at End
June	33,002	26,978	231,077
July	34,424	34,575	230,915
August	34,586	38,195	227,583
September	34,355	37,232	224,732

(2.) Shipments are steadily mounting:

Year 1932	317,261
Year 1933	347,156
Year 1934	379,807
9 months 1935—	
Actual	305,434
3 months 1935—	
Estimated	105,000
	410,434

Shipments in 1935 will, in all probability, be the best since 1931 when 429,949 tons was shipped, and will be 30,000 tons more than in 1934.

(3.) Stocks decreased 162 tons in July, 3332 tons in August, and 2851 tons in September. A large decrease is expected in October.

Stocks on Sept. 30, 1935, were 5487 tons lower than on the same date last year, indicating that production and consumption have been in balance during the past year. Stocks reached their peak on July 31, 1934, when the total was 240,595 tons. The total on Sept. 30, 1935, of 224,732 tons shows a decrease of 15,863 tons.

(4.) Consumption is steadily increasing as shown by the monthly average shipments following:

	Tons
Year 1932	26,438
Year 1933	28,930
Year 1934	31,651
9 months 1935	33,937

Tool Steel Course Offered by A. S. M.

THE New Haven, Conn., chapter of the American Society for Metals on Nov. 18 will inaugurate a course on tool steel with R. M. Brick of the department of metallurgy, Yale University, as lecturer. These lectures will be practical in every sense of the word, with discussions kept as non-technical as possible. The course will be conducted on Monday evenings at Hammond Laboratory, 14 Mansfield Street, New Haven, and will be given free to all members of the local chapter. Non-members may attend by paying a small fee.

Heavy Pig Iron Buying Precedes Advances by Valley Furnaces

YOUNGSTOWN, Nov. 4.—Finished steel shipments in October exceeded at least by 10 per cent the movement during September. Bookings and releases in the first few days of November have leveled off, but several influences appear in the offing that might sponsor a further lift in general activity in the Valleys. An almost assured prospect is the placing of heavier orders for automotive consumption. While releases for such purpose have increased gradually during the past fortnight, new orders have been disappointingly small in the aggregate, and producers here are banking rather heavily on additional tonnage for year-end operating schedules. Indications of higher steel prices offer another spur to consumer buying, but thus far the only advance here has been in pig iron, which was raised \$1 a ton on Nov. 1.

Raw steel output in the current week will be largely unchanged. The Youngstown Sheet & Tube Co. still is operating 11 out of 12 open-hearths at Campbell works, with the Brier Hill plant still inactive. The Republic Steel Corp. is operating nine out of 15 open-hearth furnaces at Youngstown, seven out of eight at Warren, and eight out of 19 at Canton and Massillon. Schedules at other mills in this district are virtually unchanged.

Sheets, strip and hot-rolled bar

mills are maintaining the heaviest schedules among finishing mills. Alloy steel production is lagging slightly. Wire mills at Campbell are producing at a fairly satisfactory rate.

The advance of \$1 a ton in pig iron drove in a substantial amount of round-lot contracting, and shipments likely will be heavy during the remainder of the fourth quarter. Any unshipped tonnage booked at the old prices will be cancelled at the close of December. All spot orders entered after Nov. 1 will be at the new quotations, which now are \$19.50 for No. 2 foundry and malleable, \$19 for basic and \$20 for Bessemer, a gross ton, Youngstown. The same prices have been established at Sharpsville, Pa.

Whether the scrap market absorbs strength from the higher pig iron prices and the strong tone in steel quotations remains to be seen. Recent round-lot sales of No. 1 heavy-melting steel, at \$13.75, delivered, represent a 25c. a ton drop in the past two weeks. Mills are being cautious in placing new orders for scrap, pending a more definite trend in prices. Unless cast scrap scores a sympathetic advance with pig iron prices, it seems quite likely that heavier scrap charges, with the aid of higher silicon pig iron, will be the rule among foundries.

Cast Iron Pipe

Millis, Mass., is in the market for a standpipe and later will purchase a tonnage of pipe.

Sturbridge, Mass., will close bids Nov. 8 on 260 tons of 6 and 8-in. Hegeman-Harris, 185 Devonshire Street, Boston, are engineers.

Commanding Officer, Watertown Arsenal, Watertown, Mass., closes bids Nov. 11 for pipe and pipe fittings (Circular 218).

Stillwater, N. Y., plans pipe lines for water supply; also 100,000-gal. elevated steel tank and other waterworks equipment. Cost about \$70,000. Financing is being arranged through Federal aid. W. T. Field Engineering Co., Flower Building, Watertown, N. Y., is consulting engineer.

Chicago has received low bid from Lynchburg Foundry Co. for 400 tons of 24-in.

Jackson County Public Water Supply District No. 1, Grandview, Mo., recently organized, care of Charles A. Haskins & Co., Finance Building, Kansas City, Mo., consulting engineers, plans about 175,500 ft. of 2, 4, 6 and 8-in. for water system near Grandview; also will install elevated steel tank and tower, pumping plant and other waterworks equipment. Cost about \$325,000.

Woodland, Ga., plans pipe lines for water supply; also 50,000-gal. steel standpipe and other waterworks installation; bids to be asked in December. J. B. McCrary Co., Atlanta, Ga., is consulting engineer.

Greenbrier, Tenn., closes bids Nov. 13 for pipe for water supply and other waterworks installation. Freeland, Roberts & Co., Independent Life Building, Nashville, Tenn., are consulting engineers.

Wetmore, Kan., plans pipe lines for water system; also other waterworks installation. Fund of \$37,000 is being arranged through Federal aid and bond issue. Shockley Engineering Co., Graphic Arts Building, Kansas City, Mo., is consulting engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, closes bids Nov. 12 for iron pipe for Mare Island Navy yard (Schedule 6355).

LaFollette, Tenn., asks bids until Nov. 18 for pipe lines for water supply and other waterworks equipment. Freeland, Roberts & Co., Independent Life Building, Nashville, Tenn., are consulting engineers.

Onamia, Minn., closes bids Nov. 9 for pipe for water system; also for steel tank, pumping machinery and auxiliary waterworks equipment. Fund of \$41,800 has been arranged. Druar & Milinowski, Globe Building, St. Paul, Minn., are consulting engineers.

Sulphur Springs, Tex., will soon take bids for about 112,000 ft. of 6 and 8-in. for water supply; also for pumping machinery and other waterworks installation. Fund of \$86,000 has been arranged. Powell & Powell, Republic Bank Building, Dallas, Tex., are consulting engineers.

Matton, Wash., has placed 300 tons of 4 to 8-in. with United States Pipe & Foundry Co.

Escalante, Utah, closes bids Nov. 14 for pipe for main trunk water line and for distribution system; also other waterworks equipment. Fund of \$87,500 has been arranged through Federal aid. J. H. Clark, Panguitch, Utah, is engineer.

Torrey, Utah, has awarded 112 tons to Pacific States Cast Iron Pipe Co.

Eureka City, Utah, opened bids Nov. 7 on 100 tons of 4 and 8-in.

Minersville, Utah, will open bids soon on 340 tons of 6 and 8-in.

Lewiston, Idaho, has taken bids on 162 tons of 4 to 8-in.

Beverly Hills, Cal., has awarded general contracts for which 560 tons are required.

NRA Round Table Scheduled On Dec. 9

WASHINGTON, Nov. 5.—In announcing today that he had set Dec. 9 as the date for a round table discussion between labor and management to consider the need for continuing NRA, Maj. George L. Berry, coordinator for industrial cooperation, said that the iron and steel industry has not definitely committed itself to attend the conference.

Major Berry stated that he had not as yet received a reply to a letter he wrote to Walter S. Tower, executive secretary of the American Iron and Steel Institute in which Major Berry outlined the procedure to be followed at the meeting. The procedure was outlined in reply to a letter from Mr. Tower to whom Major Berry had addressed an invitation for the iron and steel industry to participate in the meeting.

Major Berry also said he had received no reply to a second letter he directed to Alfred Reeves, vice-president, Automobile Manufacturers' Association, who had previously rejected the invitation to the motor industry to attend the meeting.

In fixing the date for the Washington meeting, Major Berry gave out a copy of additional letters being sent out to labor, management and trade associations in which he outlined the plan of the meeting. It follows that set forth in the letter to Mr. Tower. Briefly, it calls for a general meeting to be followed by group meetings of related industries and labor. These group meetings will select representatives who will make up what is called a council for industrial progress. The council will receive proposals and prepare a program. Major Berry said he did not know whether legislation would be recommended or not. This point, he stated, is being left to industry.

He again expressed gratification at replies accepting invitations to the meeting, and it was on the basis of the responses that it was called.

Capital Goods Index

THE index measuring the rate of activity in capital goods has again advanced, despite the fact that seasonal values for the automobile component have been readjusted, and a normal balance exists. Expanding steel ingot output and industrial gains in the Pittsburgh area were partly responsible last week for the recorded advance.

The present level of 74.1 is thus practically double last year's corresponding figure, while less than two points beneath that for 1930.

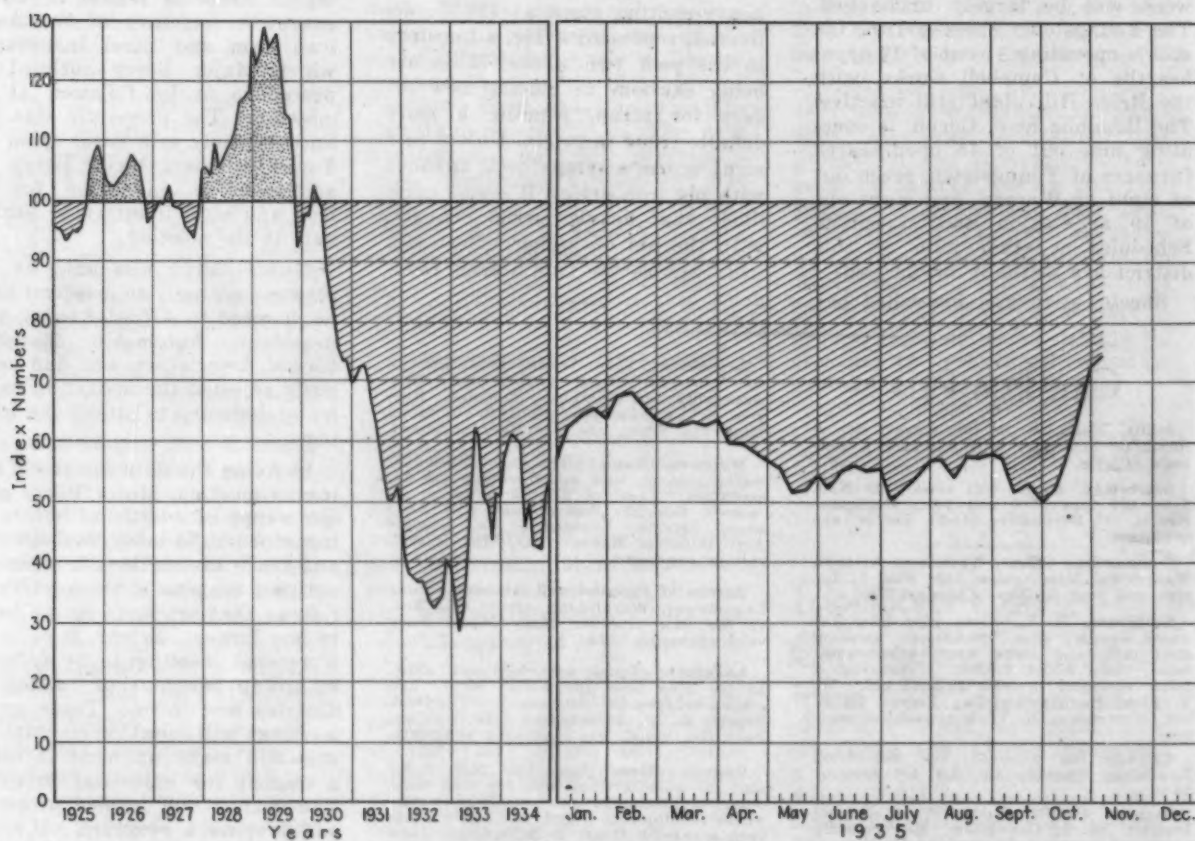
The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-'27 = 100)

Last week (est.)	74.1
Preceding week (rev.)	72.7
Same week last month	52.9
Same week 1934	41.0
Same week 1933	42.3
Same week 1932	34.1
Same week 1931	49.1
Same week 1930	75.4
Same week 1929	115.3

Automobile Production at Variance With Normal Seasonal Movement

THE necessity for taking seasonal elements into account when computing indices of business activity is quite commonly understood, but that these forces have recently exhibited a pronounced tendency to shift about is less clearly realized. Unmistakable symptoms of such a change occurring in the automobile industry were first noticed on Aug. 3, when the Ford shutdown commenced, though not until the following week



(1925-27 Average = 100)

The Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, the current year by weeks.

Components of the index: Steel ingot production rate, from THE IRON AGE; revenue freight carloadings of forest products, from Association of American Railroads; automobile production, from Cram's Automotive Reports; heavy construction contract awards, from Engineering News Record; index of productive activity in Pittsburgh district, from Bureau of Business Research of University of Pittsburgh.

Again Rises Sharply ▲ ▲ ▲

did that movement become general. Its effect was to cut car output sharply, which for the first time fell behind 1934.

In the following period production again exceeded the 1934 figure, but for the final week in August and in all but one week of September, assemblies remained beneath the corresponding 1934 level. Since, with the exception of these six weeks only, current production has consistently maintained its superiority over the preceding year, and popular belief in the soundness of business recovery has not been shaken, the conclusion that the automotive industry's normal periodic slump simply took place prematurely this year becomes inescapable.

As a matter of fact, new models are appearing two months earlier this year than formerly, a subject which, in itself, has already grown commonplace. But the effects of this irregularity on seasonally adjusted indices attempting to mea-

sure production trends may, perhaps, require some additional clarification.

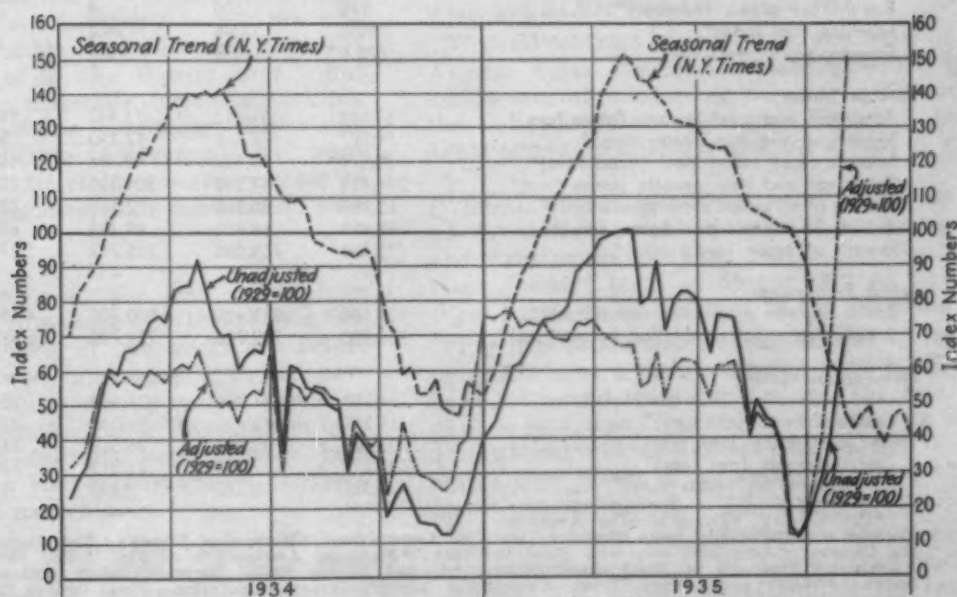
The accompanying chart, based on THE IRON AGE index of automobile production and the New York Times' seasonal correctives, clearly reveals how these forces operate. During 1934, except for minor fluctuations, weekly output of cars conformed very closely to the computed seasonal movement. This is shown on the chart by the unadjusted member of the series in its relation to the bar line above. Production reached its peak at the end of April, and its low point in the November-December period.

With but minor variations, the records of earlier years all run parallel. The seasonal trend for 1934, as devised by the New York Times, represents the net average effect of this movement during the period from 1927 to 1932, while that for 1935 covers 1933 and 1934 also.

In the current year, however, the fact that new model introductions have been advanced two months earlier than customary is, at the moment, tending to inflate the adjusted production index excessively. The upswing from the low figure of but 12,600 cars, established in the third week of September, is now taking place coincident with a still declining seasonal corrective line. Accordingly, the adjusted index shown on the chart has already been boosted above the 100 per cent line, whereas at this time last year it stood 85 points lower.

Inasmuch as reliable estimates indicate that production this year is running about 30 per cent ahead of 1934, only part of the above mentioned discrepancy can be attributed to business recovery. The residual amount, due to unbalanced seasonal correctives, has consequently been readjusted before introduction into the capital goods activities index.

Effect of Seasonal Variation on Weekly Production of Automobiles



Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	September, 1935	August, 1935	September, 1934	Nine Months, 1934	Nine Months, 1935
Raw Materials:					
Lake ore consumption (gross tons)*.....	2,654,278	2,615,927	1,236,392	18,003,319	21,809,907
Coke production (net tons)*.....	2,891,530	2,833,707	2,229,571	24,574,449	25,360,396
Pig Iron:					
Pig iron output—monthly (gross tons)*.....	1,776,476	1,761,286	898,000	12,976,000	14,857,025
Pig iron output—daily (gross tons)*.....	59,216	56,816	29,935	39,819	56,523
Castings:					
Malleable castings—production (net tons)*....	36,996	35,245	21,541	282,880	333,053
Malleable castings—orders (net tons)*.....	35,658	35,602	19,511	270,326	317,014
Steel castings—production (net tons)*.....	35,411	34,972	31,816	371,230	282,433
Steel castings—orders (net tons)*.....	29,995	45,426	20,030	360,933	292,361
Steel Ingots:					
Steel ingot production—monthly (gross tons)*..	2,829,835	2,919,326	1,268,977	20,542,334	24,044,076
Steel ingot production—daily (gross tons)*.....	113,193	108,123	50,759	88,165	103,193
Steel ingot production—per cent of capacity*..	51.13	48.84	23.05	40.04	46.61
Employment in Steel Industry:					
Total employees*.....	424,779	423,925	381,828	402,223	420,014
Total payrolls (thousands of dollars)*.....	\$45,473	\$47,890	\$29,143	\$356,819	\$429,402
Average hours worked per week*.....	34.0	35.0	24.2	28.2	33.7
Finished Steel:					
Trackwork shipments (net tons)*.....	2,962	4,028	3,383	42,620	32,619
Sheet steel sales (net tons)*.....	196,423	207,140	77,063	1,401,288	1,754,861
Sheet steel production (net tons)*.....	190,701	206,613	76,051	1,487,765	1,768,800
Fabricated shape orders (net tons)*.....	83,499	100,211	66,586	832,520	765,311
Fabricated shape shipments (net tons)*.....	93,748	122,256	105,233	792,796	820,250
Fabricated plate orders (net tons)*.....	31,105	23,628	15,108	182,757	173,085
Reinforcing bar awards (net tons)*.....	109,835	101,140	7,550	158,280	331,375
U. S. Steel Corp'n. shipments (tons)*.....	614,933	624,497	370,306	4,797,162	5,341,223
Ohio River steel shipments (net tons)*.....	92,898	92,501	45,848	488,125	671,511
Fabricated Products:					
Automobile production, U. S. and Canada*.....	95,128	247,743	175,586	2,492,695	3,066,456
Construction contracts, 37 Eastern States*.....	\$167,376,200	\$168,557,200	\$110,151,200	\$1,203,507,200	\$1,191,697,700
Steel barrel shipments (number)*.....	622,187	600,993	417,114	5,215,953	4,811,793
Steel furniture shipments (dollars)*.....	1,361,449	1,327,252	879,243	8,680,862	10,811,995
Steel boiler orders (sq. ft.)*.....	575,031	543,975	539,242	3,406,353	4,309,092
Locomotive orders (number)*.....	7	0	1	89	28
Freight car orders (number)*.....	110	100	4	23,000	7,293
Machine tool index*.....	80.0	125.8	36.2	†37.4	108.5
Foundry equipment index*.....	128.4	113.0	46.4	†46.7	†111.8
Foreign Trade:					
Total iron and steel imports (gross tons)*.....	53,158	31,312	23,847	241,579	299,255
Imports of pig iron (gross tons)*.....	14,357	8,568	12,290	99,091	81,930
Imports of all rolled steel (gross tons)*.....	22,970	17,657	8,196	85,969	152,318
Total iron and steel exports (gross tons)*.....	244,419	247,312	301,330	2,030,637	2,384,467
Exports of all rolled steel (gross tons)*.....	63,898	82,866	72,165	723,485	610,135
Exports of finished steel (gross tons)*.....	58,893	64,400	69,302	634,833	558,980
Exports of scrap (gross tons)*.....	173,852	156,685	225,212	1,275,414	1,698,441
British Production:					
British pig iron production (gross tons)*.....	529,600	543,400	500,300	4,430,300	4,792,300
British steel ingot production (gross tons)*.....	855,900	759,900	734,700	6,627,200	7,220,300
Non-Ferrous Metals:					
Lead production (net tons)*.....	34,350	34,856	31,939	304,845	296,124
Lead shipments (net tons)*.....	37,232	38,195	36,018	277,547	305,434
Zinc production (net tons)*.....	36,088	35,922	26,515	261,448	317,052
Zinc shipments (net tons)*.....	42,217	39,200	21,913	260,438	328,741
Deliveries of tin (gross tons)*.....	5,360	5,320	3,850	33,915	44,360

*Preliminary. †Three Months' Average.

Source of figures: *Lake Superior Iron Ore Association; †Bureau of Mines; ‡THE IRON AGE; §Bureau of the Census; ¶American Iron and Steel Institute; †National Association of Flat-Rolled Steel Manufacturers; †American Institute of Steel Construction; †United States Steel Corp'n.; †United States Engineer, Pittsburgh; †When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; †F. W. Dodge Corp'n.; †Railway Age; †National Machine Tool Builders Association; †Foundry Equipment Manufacturers Association; †Department of Commerce; †British Iron and Steel Federation; †American Bureau of Metal Statistics; †American Zinc Institute, Inc.; †New York Commodities Exchange.

SUMMARY OF THIS WEEK'S BUSINESS

Semi-Finished Steel Marked Up \$2 A Ton by Large Producer

Advances of \$1 a Ton on Finished Steel Expected To Follow—Railroad Demand Improves—Pig Iron Output Up 8 Per Cent in October

STEEL ingot output has declined from 53½ to 52½ per cent of capacity, but the recession cannot be considered significant in view of accumulating evidences of expanding demand.

Automobile production of more than 300,000 units is said to be assured for both November and December. Construction, with the rapid maturing of numerous WPA and other Government-sponsored projects, will soon take increased tonnages of iron and steel. The railroads, following recent gains in carloadings, are hastening to make needed but long deferred expenditures for rolling stock and maintenance of way.

Aside from indications of expanding steel consumption by the heavy industries, the prospect of price increases is likely to stimulate buying between now and Jan. 1. A large Pittsburgh producer has advanced rerolling billets, slabs and blooms to \$29 and sheet bars to \$30, an increase of \$2 a ton, and an advance of \$1 a ton on finished steel is expected to follow. The market has not been entirely free from price irregularities; reinforcing bar prices are still unsettled, particularly in the New York district, and only recently there was a reversion to the pre-code practice of granting sizable concessions on bars and sheets to larger buyers in the Detroit area. But higher costs of primary materials, including fuel, pig iron and fluorspar, and the possibility that rising living costs may soon dictate an advance in mill wage rates have forced the logic of an upward revision of steel prices even on producers, who, until lately, have opposed such a move.

ADDITIONAL advances in pig iron prices have raised THE IRON AGE composite to \$18.84 a ton, or \$1 a ton above the level of two weeks ago before the initial increases were announced. Prices have now moved upward at all producing centers except on the Coast and in the South. Since Birmingham quotations for Northern delivery have already been marked up \$1 a ton, a similar advance on Southern shipments is expected momentarily.

Pig iron buyers throughout the country covered their requirements for the remainder of the quarter prior to the boost in prices. Similar forward covering is already getting under way with respect to steel.

Ford has bought 20,000 tons of sheets and will probably make further purchases in the coming week.

Other large orders from automotive interests are reported. Specifications from the motor car industry have not yet shown a proportionate increase, but are evidently due for considerable expansion shortly.

THE Louisville & Nashville has ordered 20,000 tons of rails from the Ensley mill, and close to 40,000 tons of new rail business is in prospect in the Chicago district. The Pennsylvania has definitely decided to go ahead with a program calling for 10,900 freight cars, 100 locomotives and the reconstruction of 1000 cars. Part of the cars will be built in the road's own shops and the remainder will be bought from car builders. This line will also resume electrification work, which is now complete from New York to Washington and as far as Paoli west of Philadelphia. The Milwaukee Road contemplates the purchase of 15 locomotives.

Fabricated steel awards of 23,100 tons are the largest since the second week of September and compare with 17,900 tons last week. New projects total 17,825 tons as against 14,600 tons in the previous week and 24,300 tons two weeks ago.

General contract awards have been made by the Los Angeles water district for three schedules involving 14,250 tons of reinforcing bars for a 25-mile unit of the Colorado River aqueduct. New bids have been asked on two schedules calling for a total of 9000 tons.

STEEL output is off one point to 44 per cent at Pittsburgh, seven points to 33 per cent at Buffalo and eight points to 46 per cent in the South, but has risen one-half point to 56 per cent at Chicago and three points to 81 per cent in the Wheeling district.

Pig iron production in October was 1,978,411 tons, or 63,820 tons a day, compared with 1,776,476 tons, or 59,216 tons daily, in September. The gain, in terms of daily rate, was 7.8 per cent. Furnaces in blast Nov. 1 numbered 116 as against 104 on Oct. 1. Twelve stacks were blown in during the month, and none was blown out or banked.

Scrap markets are quiescent, with prices in most centers unchanged. At St. Louis heavy melting steel advanced 25c. a ton, but at Buffalo the same grade declined 50c. a ton. THE IRON AGE scrap composite is unchanged at \$12.58 a ton. The finished steel composite also is unaltered at 2.130c. a lb.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Nov. 5, 1935	Oct. 29, 1935	Oct. 8, 1935	Nov. 7, 1934
No. 2 fdy., Philadelphia.....	\$21.3132	\$20.3132	\$20.3132	\$20.26
No. 2, Valley furnace.....	19.50	18.50	18.50	18.50
No. 2 Southern, Cin'ti.....	20.2007	19.2007	19.2007	19.13
No. 2, Birmingham.....	14.50	14.50	14.50	14.50
No. 2 foundry, Chicago*.....	19.50	19.50	18.50	18.50
Basic, del'd eastern Pa.....	20.8132	19.8132	19.8132	19.76
Basic, Valley furnace.....	19.00	18.00	18.00	18.00
Malleable, Chicago*.....	19.50	19.50	18.50	18.50
Malleable, Valley.....	19.50	18.50	18.50	18.50
L. S. charcoal, Chicago.....	25.2528	25.2528	24.7528	24.04
Ferromanganese, seab'd car-lots.....	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Finished Steel

Per Lb.:	Nov. 5, 1935 Cents	Oct. 29, 1935 Cents	Oct. 8, 1935 Cents	Nov. 7, 1934 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary.....	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh....	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary....	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh.....	2.40	2.40	2.40	2.60
Wire nails, Chicago dist. mill	2.45	2.45	2.45	2.65
Plain wire, Pittsburgh.....	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., P'gh....	2.80	2.80	2.80	3.00
Barbed wire, galv., Chicago dist. mill.....	2.85	2.85	2.85	3.05
Tin plate, 100 lb. box, P'gh..	\$5.25	\$5.25	\$5.25	\$5.25

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh....	\$13.25	\$13.25	\$13.50	\$10.50
Heavy melting steel, Phila....	12.00	12.00	12.00	9.63
Heavy melting steel, Ch'go..	12.50	12.50	12.50	9.00
Carwheels, Chicago.....	12.75	12.75	12.75	10.00
Carwheels, Philadelphia.....	12.75	12.75	12.75	10.50
No. 1 cast, Pittsburgh.....	14.25	14.25	14.25	11.25
No. 1 cast, Philadelphia.....	12.75	12.75	11.75	10.75
No. 1 cast, Ch'go (net ton)...	11.25	11.25	11.25	8.00
No. 1 R.R. wrot., Phila.....	12.25	12.25	12.25	11.25
No. 1 wrot., Ch'go (net)....	9.50	9.50	9.50	8.00

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2
Light rails, Pittsburgh.....	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh.	27.00	27.00	27.00	27.00
Sheet bars, Pittsburgh.....	28.00	28.00	28.00	28.00
Slabs, Pittsburgh.....	27.00	27.00	27.00	27.00
Forging billets, Pittsburgh..	35.00	35.00	35.00	32.00
Wire rods, Pittsburgh.....	38.00	38.00	38.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	1.70	1.70	1.70	1.70

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt.....	\$3.60	\$3.60	\$3.60	\$3.85
Foundry coke, prompt.....	4.25	4.25	4.25	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery.	9.00	9.00	9.00	8.75
Lake copper, New York.....	9.37 1/2	9.37 1/2	9.37 1/2	9.12 1/2
Tin (Straits), New York.....	\$1.75	50.75	51.00	51.25
Zinc, East St. Louis.....	4.85	4.85	4.85	3.75
Zinc, New York.....	5.22 1/2	5.22 1/2	5.22 1/2	4.10
Lead, St. Louis.....	4.35	4.35	4.45	3.50
Lead, New York.....	4.50	4.50	4.60	3.65
Antimony (Asiatic), N. Y....	16.37 1/2	16.37 1/2	14.40	10.50

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.85	1.85	1.85	1.80
Bars, Chicago.....	1.90	1.90	1.90	1.85
Bars, Cleveland.....	1.90	1.90	1.90	1.85
Bars, New York.....	2.20	2.20	2.20	2.13
Plates, Pittsburgh.....	1.80	1.80	1.80	1.80
Plates, Chicago.....	1.85	1.85	1.85	1.85
Plates, New York.....	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago ..	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06 1/4	2.06 1/4	2.06 1/4	2.05 1/4
Cold-finished bars, Pittsburgh	1.95	1.95	1.95	2.10
Hot-rolled strips, Pittsburgh.	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

Nov. 5, 1935	2.130c. a Lb.
One week ago	2.130c.
One month ago	2.130c.
One year ago	2.124c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

Pig Iron

\$18.84 a Gross Ton
18.01
17.84
17.90

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap

\$12.58 a Gross Ton
12.58
12.67
9.71

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1935	2.130c., Oct. 1:	2.124c., Jan. 8	\$18.84, Nov. 5:	\$17.83, May 14	\$12.83, Oct. 1:	\$10.33, April 23
1934	2.199c., April 24:	2.003c., Jan. 2	17.90, May 1:	16.90, Jan. 27	13.00, Mar. 13:	9.50, Sept. 25
1933	2.015c., Oct. 3:	1.867c., April 13	16.90, Dec. 5:	13.56, Jan. 3	12.25, Aug. 8:	6.75, Jan. 3
1932	1.977c., Oct. 4:	1.926c., Feb. 2	14.81, Jan. 5:	13.56, Dec. 6	8.50, Jan. 12:	6.43, July 5
1931	2.037c., Jan. 13:	1.945c., Dec. 29	15.90, Jan. 6:	14.79, Dec. 15	11.33, Jan. 6:	8.50, Dec. 29
1930	2.273c., Jan. 7:	2.018c., Dec. 9	18.21, Jan. 7:	15.90, Dec. 16	15.00, Feb. 18:	11.25, Dec. 9
1929	2.317c., April 2:	2.273c., Oct. 29	18.71, May 14:	18.21, Dec. 17	17.58, Jan. 29:	14.08, Dec. 3
1928	2.286c., Dec. 11:	2.217c., July 17	18.69, Nov. 27:	17.04, July 24	16.50, Dec. 31:	13.08, July 2
1927	2.402c., Jan. 4:	2.212c., Nov. 1	19.71, Jan. 4:	17.54, Nov. 1	15.25, Jan. 11:	13.08, Nov. 22

Pittsburgh Production Off To 44 Per Cent



Valley Rate Holds and Wheeling
Average Rises—Advances Awaited
on Semi-Finished Steel

PITTSBURGH, Nov. 5.—Increasing talk of higher prices on skelp and billets, a moderately heavier demand for sheets and strip and a further contra-seasonal rise in tin plate production have been accompanied by a one-point drop in raw steel output in the Pittsburgh district to 44 per cent of capacity.

The mixed trend in this district is caused by an almost total lack of important demand for the heavier lines of hot-rolled steel, notably plates, structural shapes and rails. Despite the fact that indications point rather strongly to an upward adjustment in steel quotations, probably to be initiated by advances in certain semi-finished grades, consumers on practically all fronts are reported to be buying material only to meet prompt requirements and show no evidence of stocking. Only in the pig iron market did a fairly substantial buying movement precede the general advance of \$1 a ton.

In the Valleys and nearby northern Ohio mills production is steady at 62 per cent, with little or no change noticeable in either automotive or miscellaneous steel demand. Small improvement in incoming tonnage has boosted production in the Wheeling district three points to 81 per cent.

Only minor changes have occurred in finishing mill operations, which may more nearly reflect trends in consumer demand. Sheet mill output this week has crept ahead to a full 75 per cent rate, while strip production has lifted slightly above 50 per cent. Wire, pipe and bar mills are holding to recent schedules. The scrap market is unusually quiet.

Pig Iron

Quotations at Neville Island and Sharpsville, Pa., and Youngstown were advanced \$1 a ton on Nov. 1. No. 2 foundry and malleable now are quotable at \$19.50, basic at \$19 and Bessemer at \$20 a gross ton, furnace. A relatively substantial buying movement preceded the advances, and practically all important consumers in the Tri-State district are comfortably covered for

the remainder of the year. The heaviest commitments were made by mill and heating equipment manufacturers, which covered largely for No. 2 foundry, low phosphorous and Bessemer. All contracts entered at the old price were for a specific tonnage for delivery by Dec. 31. Releases against such contracts probably will in most instances be for the full tonnage. All spot business since Nov. 1 presumably will be entered at the higher quotations.

Semi-Finished Steel

Talk of higher prices on sheet bars, rerolling billets and skelp is spreading, but any advances still are strictly in the "conversational" stage. Some pressure against the move may be forthcoming from non-integrated steel producers, who would be forced to reflect immediately any price advances to finished steel quotations. Demand for sheet bars and forging billets partly reflects heavier automotive business. The movement of wire rods and skelp is notably steady. Carbon billets and slabs are moving in satisfactory volume to detached strip mills.

Bolts, Nuts and Rivets

October volume ran ahead of that in September. This uptrend, however, has been checked since the beginning of November. In fact, total volume momentarily is tending downward. Inquiries from the automotive industry are quite heavy, but no unusual amount of business has yet developed. Prices gradually are gaining stability, but the absence of any strong demand still is inviting occasional concessions.

Rails and Track Accessories

New rail and track fastening inquiries reported in this district are light. A small improvement in specifications against track fastening contracts has appeared. The local rail mill this week will run on sheet bars.

Cold-Finished Bars

Some producers enjoyed as high as 60 per cent increase in October shipments over those in September.

This record is considered unusual in the absence of any heavy movement to the automotive industry. Some plants still are working on fairly heavy backlogs. The continued absence of sizable orders from the automobile industry is beginning to temper forecasts of any sharp expansion of business from that source for the remainder of the year. Other consuming lines are specifying steadily, with a further slight improvement in demand from manufacturers of builders' hardware.

Reinforcing Steel

The bulk of current movement is to jobbers who are stocking quite freely in anticipation of late demand in building fields for the current season. Pennsylvania State highway construction may open up a substantial demand before the winter season. A current prospect is the proposed widening of the Perry Highway as far north as Wexford, Pa. It is indefinite, however, whether mesh, bar mat or reinforcing bars would be used for this project.

Sheet Steel Piling

The Bureau of Reclamation, Denver, drew lots for successful bidder for the Grand Coulee bridge in Washington, requiring 395 tons, which went to Carnegie-Illinois Steel Corp. The same producer also received 1130 tons through the United States Engineer office, Memphis, for a levee-wall at Cairo, Ill. Invitations for bids on Mississippi River lock and dam at Onalaska, Wis., called for 750 tons of permanent piling, instead of 500 tons as previously reported.

Plates and Shapes

Large tentative inquiries for new barge bottoms are taking more definite shape, and the prospects for sizable orders within the next several months are considered to be favorable. Recent opening of bids on Government barges showed the Treadwell Construction Co. as low bidder for construction of two 15-ton derrick boats bid to the Huntington, W. Va., United States Engineer office. On a dredge, requiring about 500 tons of plates, for the United States Engineer office, Louisville, Ky., the Marietta Mfg. Co., is low bidder.

Structural steel awards reported here for the past week expanded sharply, with awards of 3770 tons for a Brooklyn high school and 2480 tons for a court house at Buffalo the prominent items. The list was rather bare of important private projects. New inquiries were in meager volume, the only sizable item being 2000 tons for a Brooklyn high school building.

Tubular Products

Demand is expanding slightly, but is so small that the improvement is difficult to trace. Miscellaneous replenishments, with occasional spurts in orders for oil country goods, probably account chiefly for any uptrend in recent shipments. No important expansion in automotive demand for mechanical tubing has thus far materialized. Despite the fact that an advance in skelp prices, now included in talk of higher quotations for certain semi-finished grades, would imply higher prices for tubular goods, producers here are not yet willing to concede any broad adjustments in prices as far ahead as first quarter.

Bars

Automotive demand for carbon and forging bars is slowly making headway, but such movement still falls far below earlier expectations. Were it not for the steady influx of orders from other sources, shipments of hot-rolled bars might be subject to more frequent changes of pace. The base quotation of 1.85c. a lb., Pittsburgh, is meeting with little resistance. Large-lot orders, earning the deductions under the quotational set-up initiated last month, still are restricted largely to the cold finished and automobile industries.

Wire Products

Despite the extremely slow improvement in automotive demand for manufacturers' wire, aggregate volume of incoming orders is well sustained. The most favorable feature is the well diversified character of miscellaneous business, which is unusually steady. Merchant items continue to lag in line with seasonal trends. Wire mill output in this district has not

suffered materially, and average production still is running about 40 to 45 per cent.

Sheets

A further lift in automobile tonnage in the past week was largely responsible for a moderate increase in sheet operations in the current period to a full 75 per cent of rated capacity. Some units are fully engaged, while others are running practically all of their workable capacity.

Tin Plate

Increased production schedules at the leading producer's mills this week will more than offset declines in other directions, and output for the tin plate industry will hover between 55 and 60 per cent of capacity. Unless there is unusually heavy rolling of anticipatory tonnage against 1936 contracts, important producers are practically agreed that the remaining weeks of fourth quarter will witness a material decline in production. The present buoyant tone is traceable to combined influences, noticeably heavier demand for tin mill black plate, "beer plate" and rolling against next year's orders.

Strip Steel

Orders from the automotive industry improved during the past week, and operations crept ahead to slightly above 50 per cent. Few unusually large placements have been made by motor car makers, but orders for prompt shipment are appearing more frequently. Little change is discernible in the tenor of miscellaneous business. Competition on stainless steel has been rather keen during the past week, and prices have not altogether withstood pressure.

Coal and Coke

With many large coal producers in the western Pennsylvania fields still shunning the Guffey act, the coal and coke markets remain unsettled. A further damper to general demand is the continued warm weather, which has practically halted heavy movement of domestic-sized fuels. As a result of reduced shipments of domestic coal, the surplus of slack has been reduced materially, with distress slack offerings almost wholly absorbed. The price structure, while revealing no sharp breaks, leaves a good deal to be desired.

Scrap

The quiet spell that set in two weeks ago has not been broken. Although prices cannot be regarded as being strong, they are holding their own. A small lot of No. 1 heavy melting steel was sold recently at \$13.25, delivered, but the general market for that grade is largely unchanged at \$13.50, delivered mill. The flow of scrap from small dealer yards is not large and No. 1 steel orders at \$13.50 are not easy to cover profitably. The closing of several railroad lists this week will place a fairly substantial tonnage of scrap on the market and probably will indicate the early trend in scrap price.

The United States Rustless Steel & Iron Corp'n. has removed its offices to the Gulf Building, Pittsburgh, where it will continue its business separately from the organization which has been formed by Dr. B. D. Saklatwalla, who concurrently has announced the opening of offices in the Gulf Building for an industrial development organization, noted in THE IRON AGE of Sept. 26.

Weekly Indications of Steel Activity

From THE IRON AGE

	Average Year to Date			
	1935	1934	1933	1932
Steel ingot operations—Per cent of capacity	52.5	53.5	52.0	26.5
	Nov. 5, 1935	Oct. 29, 1935	Oct. 8, 1935	Nov. 7, 1934
	23,100	17,900	20,100	7,550
Fabricated structural steel awards.....	1,255	4,700	500	1,160
Fabricated plate awards.....	2,000	0	3,300	0
Sheet steel piling awards.....	1,510	9,925	6,750	1,155
Reinforcing bar awards.....				
	613,655	668,280	123,557	105,902
	54,690	47,350	276,875	170,211

Chicago Steel Rate Rises To 56 Per Cent



Steel Demand Is Well Sustained
and Price Revisions Are in Offing—
Duluth Furnace Is Blown In

CHICAGO, Nov. 5.—Fairer trade winds are blowing in the Chicago iron and steel market. Both new buying and specifications for finished steel products are again expanding, though so far the stimulus is provided for the most part by automobile builders. The farm implement group and the miscellaneous trade are steady consumers, and the railroads give excellent indication that they may soon be large scale buyers. A number of railroad equipment programs are taking definite shape and rail inquiries are expected to top 40,000 tons before the middle of the month. In the meantime the Louisville & Nashville has placed 20,000 tons of rails with the Tennessee Coal, Iron & Railroad Co. WPA funds are being released in satisfying volume and structural tonnages reaching shops are beginning to climb.

All price structures are firm and some steel consumers are making commitments in anticipation of higher quotations. As matters now stand there is strong disposition among producers to jack-up semi-finished prices on the premise that costs prohibit profits. Many sellers are not in favor of disturbing the market by advancing finished steel prices and yet they admit that such a move is a strong possibility for deliveries to be made after the turn of the year.

Local ingot output is up one-half point to 56 per cent.

Pig Iron

Shipments in early November point to a heavier movement than in October. Most consumers are well covered and buying has dropped back to spot-lot basis. Producers are still operating on the code plan and recent bookings must be delivered in the current quarter. This raises the question as to what part of the tonnage will be carried forward by consumers for use in January and February. The general opinion is that the carry-over will not be troublesome. The merchant stack at Duluth is now in blast.

Coke

November prices for by-product foundry coke are unchanged at \$9 a ton, Chicago ovens, for delivery outside the switching district. October shipments paralleled September and the current rate augurs well for November.

Cast Iron Pipe

Inquiries and awards are all small and reflect the character of business reaching foundries as the result of efforts by WPA, which now gives indication of turning loose in the near future a veritable flood of small tonnages. Lynchburg Foundry Co. is low bidder on 400 tons of 24-in. pipe for Chicago. Foundries report that operations are being held close to shipments. In some cases foundry stocks are being reduced. Prices remain very firm.

Reinforcing Bars

A change in labor rates to become effective about Jan. 1 is de-

laying bid taking on a number of large Sanitary District jobs. In fact, bids on one such project have been returned because the appropriation does not cover the increased charges for labor. Many small WPA jobs are now reaching shops and there is foreseen such a rush of these small tonnages that estimating departments may easily become swamped in the near future. Low bidder is announced on the Milwaukee housing project. Bids on two similar projects were taken in Chicago on Nov. 4, and the third local job will come up Nov. 19. Prices are on a better footing, but their real security cannot be determined because of lack of real tonnage tests.

Plates

The outlook in the railroad equipment market continues to improve and the steel trade sees substantial support from that direction within the next few months. The Burlington program is fast taking shape and now railroads other than in the West and Southwest are talking about their needs. The Pennsylvania program is particularly attractive, and though many of the cars will be built in that railroad's shops, others will be contracted for and Western builders expect to have a chance to bid. Plate tonnage remains light, but mills will participate to some extent in the growing amount of WPA work that is now coming out for figures. There is no definite word concerning the three dams that are still needed at locks that



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have already been constructed on the Mississippi River.

Sheets

The added requirements of automobile plants have brought some local units to capacity operations. The miscellaneous demand for sheets is well sustained and jobbers report active business for this time of year. Contemplated railroad equipment programs will afford some attractive car roof tonnages to hot mills.

Rails

Inquiries are once again making their appearance, and this market is taking on added life. Inquiries that are now before the trade total 17,000 tons and there is every prospect that the pending tonnage will be increased to at least 40,000 tons before the next two weeks pass. Scattered tonnages that have been reaching mills have extended present rolling schedules to the middle of December, and with tonnages now in sight it seems assured that there will be little or no interruption in rail mill operations at the end of the year. Track accessories are being placed in small lots and light rails are sluggish.

Wire

Operations are steady. The slack in country demand from those areas that are now in the grip of winter weather is offset by the growing requirements of the automobile industry. The Northwest is experiencing sub-zero weather and outdoor work is at a standstill.

However, rural areas in the South are taking more than normal seasonal needs. Prices are on a more stable footing and some business has started to reach mills from those users who foresee higher prices in the not far distant future.

Bars

There has been no additional growth in the demand for bars from automobile concerns. Farm implement manufacturers are about in the same general position, though, having taken steel ahead of requirements, they are now in some cases entering lighter specifications. Miscellaneous demand shows some signs of being spotty, but the change does not seem to indicate a trend away from active use by that large body of consumers.

Structural Material

New awards have bounded upward to 5000 tons, led by a 2000-ton bridge in Missouri. Fresh inquiries are also in good volume, in which is included much bridge and overhead crossing tonnage. Private work is very scarce and there is little of that kind of tonnage in prospect.

Scrap

All phases of this market give rather certain signs of tightening. Mills are taking heavy melting steel more freely and dealers are having to scramble to cover old commitments. Bidding against railroad lists is active and prices accepted are gradually moving up-

ward. Malleable grades are particularly tight and railroad offerings bring as high as \$15.75 a ton, delivered. Brokers have not had the downward swing that they are accustomed to expect after peak prices have started to crumble, and in many cases they are being left with slim profits on deals within the past few weeks. A feature of the market today is that unsolicited inquiries are the heaviest of the year.

Reinforcing Steel

Awards 1510 Tons—New
Projects 7420 Tons

AWARDS

New York, 350 tons, incinerator, to Carroll-McCreary Co.

Staten Island, N. Y., 274 tons, bars, WPA project at West Brighton, to W. Ames & Co., Jersey City.

Chester, Pa., 135 tons, post office, to Sweets Steel Co.

State of Illinois, 100 tons, bridge work, to Concrete Engineering Co.

St. Louis, 100 tons, Arsenal Street sewer; Fruin-Conlon Contracting Co., general contractor.

Helena, Mont., 150 tons, State warehouse, to Northwest Steel Rolling Mills.

State of Colorado, 100 tons, highway work in four counties, to unnamed bidders.

Tacoma, Wash., 300 tons, alternate on Green River pipe line, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Waltham, Mass., 243 tons, State bridge; previously reported as 100 tons.

Boston, 350 tons, sewer; bids opened.

New York, 300 tons, depression of New York Central tracks, West Thirty-fourth to Forty-second Streets; general contract let to George J. Atwell Foundation Corp., New York.

New York, 1500 tons, depression of New York Central tracks, Seventy-sixth to Seventy-ninth Streets; bids to be taken Nov. 22.

Niagara Falls, N. Y., 800 tons, sewage disposal plant.

Buffalo, 300 to 400 tons, WPA housing project; bids Nov. 22.

Buffalo, 240 tons, Federal building; Fleisher Engineering Co., St. Paul, low bidder.

State of Wisconsin, 320 tons, three bridges; bids Nov. 13.

State of Wisconsin, 320 tons, grade separations; bids Nov. 13.

Milwaukee, 850 tons, housing project; George A. Fuller Co., low bidder.

Milwaukee, 250 tons, school; Bentley Construction Co., general contractor.

Gurnee, Ill., 200 tons, bridge; J. W. Snyder, low bidder.

Casper, Wyo., 1275 tons, Seminoe dam and power plant; bids Nov. 26.

San Francisco, 240 tons, storehouse at Fort Scott; bids opened.

State of California, 169 tons, State highway work in four counties; bids Nov. 21.

San Gabriel, Cal., 100 tons, San Gabriel Union Church; general contract awarded.

Ketchikan, Alaska, 100 tons, Federal building; Kyle Steel Construction Co., low bidder.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	Base per Lb.
F.o.b. Pittsburgh	1.55c
F.o.b. Chicago	1.50c
F.o.b. Gary	1.50c
F.o.b. Duluth	2.00c
Del'd Detroit	2.00c
F.o.b. Cleveland	1.90c
F.o.b. Buffalo	1.95c
Del'd Philadelphia	2.10c
Del'd New York	2.30c
F.o.b. Birmingham	2.00c
F.o.b. cars dock Gulf ports	2.25c
F.o.b. cars dock Pacific ports	2.40c

Roll Steel

(For merchant trade)	
F.o.b. Pittsburgh	1.70c
F.o.b. Chicago	1.65c
F.o.b. Gary	1.65c
F.o.b. Moline, Ill.	1.75c
F.o.b. Cleveland	1.75c
F.o.b. Buffalo	1.80c
F.o.b. Birmingham	1.85c
F.o.b. cars dock Gulf ports	2.10c
F.o.b. cars dock Pacific ports	2.35c

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	2.50c
F.o.b. Chicago	2.10c
F.o.b. Gary	2.10c
Del'd Detroit	2.30c
F.o.b. Cleveland	2.10c
F.o.b. Youngstown	2.10c
F.o.b. Buffalo	2.10c
F.o.b. Birmingham	2.10c
F.o.b. cars dock Gulf ports	2.45c
F.o.b. cars dock Pacific ports	2.45c

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	1.90c
F.o.b. Chicago	1.85c
F.o.b. Gary	1.85c
F.o.b. Cleveland	1.95c
F.o.b. Youngstown	1.95c
F.o.b. Buffalo	1.95c
F.o.b. Birmingham	1.95c
F.o.b. cars dock Gulf ports	2.30c
F.o.b. cars dock Pacific ports	2.30c

Iron

F.o.b. Chicago	1.30c
F.o.b. Terns Haute, Ind.	1.75c
F.o.b. Louisville, Ky.	2.10c
F.o.b. Danville, Pa.	1.90c
F.o.b. Berwick, Pa.	1.70c

Cold Finished Bars and Shafting*

Base per Lb.	
F.o.b. Pittsburgh	1.95c
F.o.b. Chicago	2.00c
F.o.b. Gary	2.00c
F.o.b. Cleveland	2.00c
F.o.b. Buffalo	2.05c
Del'd Detroit	2.15c
Del'd eastern Michigan	2.30c

* In quantities of 10,000 to 10,000 lb.

Fence and Sign Posts

Angle Line Posts	Base per Net Ton
F.o.b. Pittsburgh	\$30.00
F.o.b. Chicago	\$50.00
F.o.b. Duluth	\$1.00
F.o.b. Cleveland	\$50.00
F.o.b. Birmingham	\$50.00
F.o.b. Houston, Orange, Beaumont, Galveston	\$9.00
F.o.b. Mobile	\$8.00
F.o.b. New Orleans	\$9.00
F.o.b. Corpus Christi	\$9.00
F.o.b. cars dock Pacific ports	\$3.00

Plates

Base per Lb.	
F.o.b. Pittsburgh	1.80c
F.o.b. Chicago	1.85c
F.o.b. Gary	1.85c
Del'd Cleveland	1.95c
F.o.b. Coatesville	1.90c
F.o.b. Sparrows Point	1.90c
Del'd Philadelphia	1.90c
Del'd New York	2.00c
F.o.b. Birmingham	1.95c
F.o.b. cars dock Gulf ports	2.30c
F.o.b. cars dock Pacific ports	2.30c
Wrought iron plates, f.o.b. P'gh	3.20c

Floor Plates

F.o.b. Pittsburgh	2.35c
F.o.b. Chicago	2.40c
F.o.b. Coatesville	2.45c
F.o.b. cars dock Gulf ports	2.75c
F.o.b. cars dock Pacific ports	2.90c

Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh	1.80c
F.o.b. Chicago	1.85c
F.o.b. Cleveland	1.95c
F.o.b. Bethlehem	1.90c
Del'd Philadelphia	2.05c
Del'd New York	2.05c
F.o.b. Birmingham (standard)	1.95c
F.o.b. cars dock Gulf ports	2.20c
F.o.b. cars dock Pacific ports	2.35c

Steel Sheet Piling

Base per Lb.	
F.o.b. Pittsburgh	2.15c
F.o.b. Chicago	2.25c
F.o.b. Buffalo	2.25c
F.o.b. cars dock Gulf ports	2.60c
F.o.b. cars dock Pacific ports	2.60c

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c
No. 10, f.o.b. Gary	1.95c
No. 10, del'd Detroit	2.05c
No. 10, del'd Phila.	2.15c
No. 10, f.o.b. Birmingham	2.00c
No. 10, f.o.b. cars dock Pacific ports	2.40c

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c
No. 24, f.o.b. Gary	2.50c
No. 24, del'd Detroit	2.60c
No. 24, del'd Phila.	2.71c
No. 24, f.o.b. Birmingham	2.55c
No. 24, f.o.b. cars dock Pacific ports	3.00c

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c
No. 10 gage, f.o.b. Gary	2.60c
No. 10 gage, del'd Detroit	2.70c
No. 10 gage, del'd Phila.	2.81c
No. 10 gage, f.o.b. Birmingham	2.65c
No. 10 gage, f.o.b. cars dock Pacific ports	3.10c

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c
No. 20 gage, f.o.b. Gary	3.05c
No. 20 gage, del'd Detroit	3.15c
No. 20 gage, del'd Phila.	3.26c
No. 20 gage, f.o.b. Birmingham	3.10c
No. 20 gage, f.o.b. cars dock Pacific ports	3.50c

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.10c
No. 24, f.o.b. Gary	3.20c
No. 24, del'd Phila.	3.41c
No. 24, f.o.b. Birmingham	3.25c
No. 24, f.o.b. cars dock Pacific ports	3.70c
No. 24, wrought iron, Pittsburgh	4.95c

Long Tones

No. 24, unassorted 8-lb. coating	3.40c
F.o.b. Pittsburgh	3.50c
F.o.b. cars dock Pacific ports	4.10c

Witrous Hummeling Stock

No. 20, f.o.b. Pittsburgh	3.10c
No. 20, f.o.b. Gary	3.20c
No. 20, f.o.b. Birmingham	3.70c
No. 20, f.o.b. cars dock Pacific ports	3.70c
No. 10, f.o.b. Pittsburgh	2.50c
No. 10, f.o.b. Gary	2.60c
No. 10, f.o.b. Birmingham	3.10c
No. 10, f.o.b. cars dock Pacific ports	3.10c

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c
No. 28, Gary	2.85c
No. 28, cars dock Pacific Coast	3.35c

Tin Plate

Per Base Box	
Standard cokes, f.o.b. P'gh district mill	\$5.25
Standard cokes, f.o.b. Gary	\$5.35
Standard cokes, f.o.b. cars dock Pacific ports	\$5.90

Terne Plate

(F.o.b. Pittsburgh)	
(Per Package, 20 x 25 in.)	
8-lb. coating I.C.	\$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips

Base per Lb.	
All widths up to 24 in., P'gh	1.85c
All widths up to 24 in., Chicago	1.95c
All widths up to 24 in., del'd Detroit	2.05c
All widths up to 24 in., Birmingham	2.00c
Cooperage stock, Pittsburgh	1.35c
Cooperage stock, Chicago	2.05c

Cold-Rolled Strips

Base per Lb.	
F.o.b. Pittsburgh	2.60c
F.o.b. Cleveland	2.60c
Del'd Chicago	2.85c
F.o.b. Worcester	2.80c

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c
No. 14, Worcester	3.20c
No. 20, Pittsburgh or Cleveland	3.20c
No. 20, Worcester	3.70c

Hot-Rolled Rail Steel Strips

Base per Lb.	
F.o.b. Pittsburgh	1.70c
F.o.b. Chicago	1.75c
F.o.b. Birmingham	1.85c

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade Per Lb.	
Bright wire	2.30c
Spring wire	2.90c

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$8 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To Larger Lot Buyers

Base per bag	
Standard wire nails	\$2.40
Smooth coated nails	2.40

Base per 100 Lb.	
Annealed fence wire	\$2.45
Galvanized fence wire	2.50
Polished staples	3.10
Galvanized staples	3.35
Barbed wire, galvanized	2.80
Twisted barless wire	2.80
Woven wire fence, base column	\$3.00
Single loop bales ties, base column	\$3.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$3 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth, which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh, while Pacific Coast prices are \$8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are \$11 a ton above Pittsburgh.

On staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

Base per Lb.	
F.o.b. Pittsburgh	35 and 3 1/2 off
F.o.b. Chicago	35 off

STEEL AND WROUGHT PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Steel	Wrought Iron
Inches Black Galv.	Inches Black Galv.
1/2 to 3/4	1/2 to 3/4
1 to 1 1/4	1 to 1 1/4
1 1/2 to 2	1 1/2 to 2
2 1/2 to 3	2 1/2 to 3
3 1/2 to 4	3 1/2 to 4
4 1/2 to 5	4 1/2 to 5
5 1/2 to 6	5 1/2 to 6
6 1/2 to 7	6 1/2 to 7
7 1/2 to 8	7 1/2 to 8
8 1/2 to 9	8 1/2 to 9
9 1/2 to 10	9 1/2 to 10
10 1/2 to 11	10 1/2 to 11
11 1/2 to 12	11 1/2 to 12
12 1/2 to 13	12 1/2 to 13
13 1/2 to 14	13 1/2 to 14
14 1/2 to 15	14 1/2 to 15
15 1/2 to 16	15 1/2 to 16
16 1/2 to 17	16 1/2 to 17
17 1/2 to 18	17 1/2 to 18
18 1/2 to 19	18 1/2 to 19
19 1/2 to 20	19 1/2 to 20
20 1/2 to 21	20 1/2 to 21
21 1/2 to 22	21 1/2 to 22
22 1/2 to 23	22 1/2 to 23
23 1/2 to 24	23 1/2 to 24
24 1/2 to 25	24 1/2 to 25
25 1/2 to 26	25 1/2 to 26
26 1/2 to 27	26 1/2 to 27
27 1/2 to 28	27 1/2 to 28
28 1/2 to 29	28 1/2 to 29
29 1/2 to 30	29 1/2 to 30
30 1/2 to 31	30 1/2 to 31
31 1/2 to 32	31 1/2 to 32
32 1/2 to 33	32 1/2 to 33
33 1/2 to 34	33 1/2 to 34
34 1/2 to 35	34 1/2 to 35
35 1/2 to 36	35 1/2 to 36
36 1/2 to 37	36 1/2 to 37
37 1/2 to 38	37 1/2 to 38
38 1/2 to 39	38 1/2 to 39
39 1/2 to 40	39 1/2 to 40
40 1/2 to 41	40 1/2 to 41
41 1/2 to 42	41 1/2 to 42
42 1/2 to 43	42 1/2 to 43
43 1/2 to 44	43 1/2 to 44
44 1/2 to 45	44 1/2 to 45
45 1/2 to 46	45 1/2 to 46
46 1/2 to 47	46 1/2 to 47
47 1/2 to 48	47 1/2 to 48
48 1/2 to 49	48 1/2 to 49
49 1/2 to 50	49 1/2 to 50
50 1/2 to 51	50 1/2 to 51
51 1/2 to 52	51 1/2 to 52
52 1/2 to 53	52 1/2 to 53
53 1/2 to 54	53 1/2 to 54
54 1/2 to 55	54 1/2 to 55
55 1/2 to 56	55 1/2 to 56
56 1/2 to 57	56 1/2 to 57
57 1/2 to 58	57 1/2 to 58
58 1/2 to 59	58 1/2 to 59
59 1/2 to 60	59 1/2 to 60
60 1/2 to 61	60 1/2 to 61
61 1/2 to 62	61 1/2 to 62
62 1/2 to 63	62 1/2 to 63
63 1/2 to 64	63 1/2 to 64
64 1/2 to 65	64 1/2 to 65
65 1/2 to 66	65 1/2 to 66
66 1/2 to 67	66 1/2 to 67
67 1/2 to 68	67 1/2 to 68
68 1/2 to 69	68 1/2 to 69
69 1/2 to 70	69 1/2 to 70
70 1/2 to 71	70 1/2 to 71
71 1/2 to 72	71 1/2 to 72
72 1/2 to 73	72 1/2 to 73
73 1/2 to 74	73 1/2 to 74
74 1/2 to 75	74 1/2 to 75
75 1/2 to 76	75 1/2 to 76
76 1/2 to 77	76 1/2 to 77
77 1/2 to 78	77 1/2 to 78
78 1/2 to 79	78 1/2 to 79
79 1/2 to 80	79 1/2 to 80
80 1/2 to 81	80 1/2 to 81
81 1/2 to 82	81 1/2 to 82
82 1/2 to 83	82 1/2 to 83
83 1/2 to 84	83 1/2 to 84
84 1/2 to 85	84 1/2 to 85
85 1/2 to 86	85 1/2 to 86
86 1/2 to 87	86 1/2 to 87
87 1/2 to 88	87 1/2 to 88
88 1/2 to 89	88 1/2 to 89
89 1/2 to 90	89 1/2 to 90
90 1/2 to 91	90 1/2 to 91
91 1/2 to 92	91 1/2 to 92
92 1/2 to 93	92 1/2 to 93
93 1/2 to 94	93 1/2 to 94
94 1/2 to 95	94 1/2 to 95
95 1/2 to 96	95 1/2 to 96
96 1/2 to 97	96 1/2 to 97
97 1/2 to 98	97 1/2 to 98
98 1/2 to 99	98 1/2 to 99
99 1/2 to 100	99 1/2 to 100

Lap Weld	
2 to 3	60 51
3 1/2 to 4	63 54
4 1/2 to 5	65 56
5 1/2 to 6	67 58
6 1/2 to 7	69 60
7 1/2 to 8	71 62
8 1/2 to 9	73 64
9 1/2 to 10	75 66
10 1/2 to 11	77 68
11 1/2 to 12	79

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	75
Carriage bolts	75
Lag bolts	75
Flange bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagon	75
C.B. and square or hex. nuts, blank or tapped	75
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes to and incl.	75
1 in. diameter	75
Larger than 1 in. diameter	75
Store bolts in packages, Pittsburgh	75
Store bolts in packages, Chicago	75
Store bolts in bulk, Pittsburgh	83
Store bolts in bulk, Chicago	83
Store bolts in bulk, Cleveland	83
Tire bolts	60

Large Rivets
(1/2-in. and larger)
Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland.....\$2.90
F.o.b. Chicago.....3.00
F.o.b. Birmingham.....3.05

Small Rivets
(7/16-in. and smaller)
F.o.b. Pittsburgh.....70 and 5
F.o.b. Cleveland.....70 and 5
F.o.b. Chicago and Birm'g'm.....70 and 5

Cap and Set Screws
(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread 1/2 in. and smaller	75
Unset hex. head cap screws, U.S.S. or S.A.E. thread, 1 in. and smaller	85
Unset set screws, cut and oval points	75 and 10
Milled studs	65 to 85 and 10

Alloy and Stainless Steel

Alloy Steel Ingots
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped\$40 per gross ton

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$40 a gross ton.

Alloy Steel Bars
Price del'd Detroit is \$52.
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base2.45c.
Delivered price at Detroit is2.50c.
S.A.E.

Series	Differential
Numbers	per 100 lb.
2000 (1/2% Nickel)	0.25
2100 (2 1/2% Nickel)	0.55
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	2.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars 1/2c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars
F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo. 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)
(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Revolving slabs	15c.
Bars	23c.
Plates	26c.
Structural shapes	25c.
Sheets	23c.
Hot-rolled strip	20 3/4c.
Cold-rolled strip	27c.
Drawn wire	23c.

Raw and Semi-Finished Steel

Carbon Steel Re-rolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped\$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped\$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Per Gross Ton

Re-rolling	\$30.00
Forging quality	35.00
Delivered Detroit	
Re-rolling	\$30.00
Forging	35.00

Billets Only F.o.b. Duluth

Re-rolling	\$29.00
Forging	37.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Open-hearth or Bessemer\$28.00

Skeip

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Wire Rods

(Common, base)

	Per Gross Ton
F.o.b. Pittsburgh	\$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00
F.o.b. Galveston	44.00

CANADA

Pig Iron

Per gross ton:

Delivered Toronto
No. 1 fdy., sil. 2.25 to 2.75.....\$21.00
No. 2 fdy., sil. 1.75 to 2.75.....20.50
Malleable22.50

Delivered Montreal
No. 1 fdy., sil. 2.25 to 2.75.....\$22.50
No. 2 fdy., sil. 1.75 to 2.25.....22.00
Malleable22.50
Basic22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans
Domestic, 80% (carload)\$85.00

Spiegeleisen

Per Gross Ton Furnace
Domestic, 19 to 21%\$26.00
50-ton lots 3-mo. shipment24.00
F.o.b. New Orleans26.00

Electric Ferrosilicon

Per Gross Ton Delivered
50% (carloads)\$77.50
50% (ton lots)85.00
75% (carloads)128.00
75% (ton lots)138.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

	Per Gross Ton	Per Gross Ton
6% .....\$22.75	12% .....\$29.25	
7% .....23.75	13% .....30.75	
8% .....24.75	14% .....32.25	
9% .....25.75	15% .....33.75	
10% .....26.75	16% .....35.25	
11% .....27.75	17% .....36.75	

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.
Manganese 2 to 3%, \$1 a ton additional.
For each unit of manganese over 3%, \$1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

	Per Gross Ton	Per Gross Ton
10% .....\$27.75	14% .....\$33.25	
11% .....28.75	15% .....34.75	
12% .....29.75	16% .....36.25	
13% .....30.75	17% .....37.75	

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 ton additional.
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads\$1.35 to \$1.45
Ferrotungsten, less carloads, 1.45 to 1.55
Ferrocobalt, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in car loads10.0%
Ferrocobalt, 2% carbon16.50c. to 17.00c.
Ferrocobalt, 1% carbon17.50c. to 18.00c.
Ferrocobalt, 0.10% carbon19.50c. to 20.00c.
Ferrocobalt, 0.06% carbon20.00c. to 20.50c.
Ferrocobalt, del. per lb. contained V.\$2.70 to \$2.90
Ferrocobalt, 15 to 18% Ti, 6 to 8% C. f.o.b. furnace carload and contract per net ton.\$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with \$2 unitage50.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage65.00
Ferromolybdenum, per lb. Mo., del. 95c.
Calcium molybdate, per lb. Mo., del.80c.
Silico spiegel, per ton, f.o.b. furnace, carloads\$38.00
Ton lots or less, per ton45.50
Silico-manganese, gross ton, delivered.
2.50% carbon grade90.00
2% carbon grade95.00
1% carbon grade105.00
Spot prices\$5 a ton higher

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdy.	Malleable	Basic	Bessemer
Everett, Mass.	\$20.50	\$21.00	\$20.00	\$21.50
Bethlehem, Pa.	20.50	21.00	20.00	21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Swedeland, Pa.	20.50	21.00	20.00	21.50
Steelton, Pa.	20.50	21.00	20.00	21.50
Sparrows Point, Md.	20.50	21.00	20.00	21.50
Neville Island, Pa.	19.50	19.50	19.00	20.00
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Youngstown	19.50	20.00	18.50	20.50
Buffalo	19.50	20.00	19.00	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Cleveland	19.50	19.50	19.00	20.00
Toledo, Ohio	19.50	19.50	19.00	20.00
Jackson, Ohio	21.25	21.25	20.75	21.25
Detroit	19.50	19.50	19.00	20.00
Hamilton, Ohio	19.50	19.50	19.00	20.00
Chicago	19.50	19.50	19.00	20.00
Granite City, Ill.	19.50	19.50	19.00	20.00
Duluth, Minn.	20.00	20.00	19.50	20.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	17.50	17.00	17.00

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdy.	Malleable	Basic	Bessemer
Boston Switching District	\$21.00	\$21.50	\$20.50	\$22.00
From Everett, Mass.	21.00	21.50	20.50	22.00
Brooklyn	22.9289	23.4289	22.4283	23.9289
From East. Pa.	21.9873	22.4873	21.4873	22.9873
Newark or Jersey City, N. J.	21.9873	22.4873	21.4873	22.9873
From East. Pa.	21.3132	21.8132	20.8132	21.3132
Philadelphia	21.3132	21.8132	20.8132	21.3132
From Eastern Pa.	20.5807	20.5807	20.0807	21.0807
Cincinnati	20.5807	20.5807	20.0807	21.0807
From Hamilton, Ohio	20.8402	20.8402	20.3402	21.3402
Canton, Ohio	21.64	21.64	21.14	22.14
From Cleveland and Youngstown	21.3832	21.3832	20.8832	21.8832
Mansfield, Ohio	21.3832	21.3832	20.8832	21.8832
From Cleveland and Toledo	21.9289	21.9289	21.4289	22.4289
Indianapolis	21.9289	21.9289	21.4289	22.4289
From Hamilton, Ohio	21.6935	21.6935	21.1935	22.1935
South Bend, Ind.	21.6935	21.6935	21.1935	22.1935
From Chicago	20.57	20.57	20.07	21.07
Milwaukee	20.57	20.57	20.07	21.07
From Chicago	21.94	21.94	21.44	22.44
St. Paul	21.94	21.94	21.44	22.44
From Duluth	21.3832	21.3832	20.8832	21.8832
Davenport, Iowa	21.3832	21.3832	20.8832	21.8832
From Chicago	22.2178	22.2178	21.7178	22.7178
Kansas City	22.2178	22.2178	21.7178	22.7178
From Granite City	22.315	22.315	21.815	22.815
San Francisco, Los Angeles or Seattle. From Provo	22.315	22.315	21.815	22.815

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.\$24.00

GRAY FORGE PIG IRON

Valley furnace\$19.00
Pittsburgh district furnace19.00

CHARCOAL PIG IRON

Lake Superior furnace\$22.00

Delivered Chicago25.2528

Delivered Buffalo25.595

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$12.00 to \$13.50
No. 2 heavy melting steel	11.75 to 12.25
No. 2 railroad wrought	13.50 to 14.00
Scrap rails	15.00 to 16.00
Rails, 3 ft. and under	15.00 to 16.00
Compressed sheet steel	13.00 to 13.50
Hand bundled sheet steel	11.75 to 12.25
Hvy. steel axle turnings	11.50 to 12.00
Machine shop turnings	9.50 to 10.00
Short shov. turnings	9.50 to 10.00
Short mixed borings and turnings	8.00 to 9.00
Cast iron borings	8.00 to 9.00
Cast iron car wheels	14.00 to 14.50
Heavy breakable cast	12.25 to 12.75
No. 1 cast	14.00 to 14.50
Rail. knuckles and couplers	15.00 to 15.50
Rail. coil and leaf springs	15.50 to 16.00
Roller steel wheels	15.50 to 16.00
Low phos. billet crops	16.50 to 17.00
Low phos. sheet bar crops	15.50 to 16.00
Low phos. punchings	15.00 to 15.50
Low phos. plate scrap	14.50 to 15.00
Steel car axles	14.50 to 15.00

CHICAGO

Delivered Chicago district consumers:

Per Gross Ton	Per Net Ton
Heavy melting steel	\$12.25 to \$12.75
Automobile hvy. melt. steel	11.25 to 11.75
Shoreline steel	12.50 to 13.00
Hydraulic comp. sheets	11.50 to 12.00
Drop forge flashings	9.50 to 10.00
No. 1 busheling	11.00 to 11.50
Roller car wheels	12.75 to 13.25
Railroad tires	13.00 to 13.50
Railroad leaf springs	12.75 to 13.25
Steel turnings	9.00 to 9.50
Steel couplers and knuckles	12.25 to 12.75
Coil springs	14.25 to 14.75
Steel turnings (elec. fur.)	11.75 to 12.25
Low phos. punchings	14.50 to 15.00
Low phos. plates, 12 in. and under	14.50 to 15.00
Cast iron borings	9.00 to 9.50
Short shoveling turnings	7.50 to 8.00
Machine shop turnings	6.50 to 7.00
Revolving rails	13.50 to 14.00
Steel rails, less than 3 ft.	13.50 to 14.00
Steel rails, less than 3 ft.	15.00 to 15.50
Angle bars, steel	14.00 to 14.50
Cast iron car wheels	12.75 to 13.25
Railroad malleable	14.50 to 15.00
Agricultural malleable	10.25 to 10.75

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$12.00 to \$13.00
No. 2 heavy melting steel	11.00 to 11.50
Hydraulic compressed, new	10.00 to 10.50
Hydraulic compressed, old	8.50 to 9.00
Steel rails for rolling	14.00 to 14.50
Cast iron car wheels	12.50 to 13.00
Heavy breakable cast	11.25 to 11.75
No. 1 cast	12.50 to 13.00
Store plate (steel works)	9.00 to 9.50
Railroad malleable	13.50 to 14.00
Machine shop turnings	7.50 to 7.75
No. 1 blast furnace	5.50 to 6.00
Cast borings	5.50 to 6.00
Heavy axle turnings	9.50 to 10.00
No. 1 low phos. heavy	14.50 to 15.00
Couplers and knuckles	14.50 to 15.00
Roller steel wheels	14.50 to 15.00
Steel axles	16.00 to 16.50
Shafting	15.00 to 15.50
No. 1 railroad wrought	12.00 to 12.50
Spec. iron and steel pipe	9.50 to 10.00
Bundled sheets	10.50 to 11.00
No. 1 forge fire	10.50 to 11.00
Cast borings (chem.)	10.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$10.00 to \$10.50
No. 2 heavy melting steel	8.00 to 8.50
Scrap rails for melting	9.25 to 9.75
Loose sheet clippings	8.00 to 8.50
Bundled sheets	7.25 to 7.75
Cast iron borings	5.50 to 6.00
Machine shop turnings	5.75 to 6.25
No. 1 busheling	7.25 to 7.75
No. 2 busheling	3.75 to 4.25
Rails for rolling	10.25 to 10.75
No. 1 locomotive tires	8.50 to 9.00
Short rails	13.00 to 13.50
Cast iron car wheels	9.50 to 10.00
No. 1 machinery cast	10.50 to 11.00
No. 1 railroad cast	9.75 to 10.25
Burnt cast	7.25 to 7.75
Store plate	7.25 to 7.75
Agricultural malleable	9.25 to 9.75
Railroad malleable	10.50 to 11.00

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$12.25 to \$12.50
No. 2 heavy melting steel	11.25 to 11.50
Compressed sheet steel	11.00 to 11.50
Light bundled sheet stampings	9.25 to 9.75
Drop forge flashings	10.25 to 10.75
Machine shop turnings	7.25 to 7.75
Short shoveling turnings	7.75 to 8.25
No. 1 busheling	10.50 to 11.00
Steel axle turnings	10.25 to 10.75
Low phos. billet crops	15.00 to 15.50
Cast iron borings	5.50 to 6.00
Mixed borings and short turnings	7.50 to 8.00
No. 2 busheling	7.50 to 8.00
No. 1 cast	13.50 to 14.00
Railroad grate bars	7.00 to 7.50
Store plate	7.50 to 8.00
Rails under 3 ft.	15.50 to 16.00
Rails for rolling	15.50 to 16.00
Railroad malleable	15.50 to 16.00
Cast iron car wheels	10.75 to 11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	\$11.50 to \$12.00
No. 2 heavy melting scrap	10.00 to 10.50
Scrap rails	12.00 to 12.50
New hydraulic comp. sheets	10.00 to 10.50
Old hydraulic comp. sheets	9.00 to 9.50
Drop forge flashings	10.00 to 10.50
No. 1 busheling	10.00 to 10.50
Hvy. steel axle turnings	10.50 to 11.00
Machine shop turnings	5.50 to 6.00
Knuckles and couplers	13.00 to 14.00
Coil and leaf springs	13.00 to 14.00
Roller steel wheels	15.00 to 16.00
Low phos. billet crops	14.50 to 15.00
Short shov. steel turnings	7.50 to 8.00
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Steel rails, 3 ft. and under	14.50 to 15.00
Steel car axles	12.50 to 13.00
Iron axles	12.50 to 13.00
No. 1 machinery cast	12.50 to 13.00
No. 1 cupola cast	11.50 to 12.00
Store plate	10.00 to 10.50
Cast iron car wheels	14.50 to 15.00
Railroad malleable	12.00 to 12.50
Chemical borings	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$9.50 to \$9.75
No. 2 heavy melting steel	7.15 to 7.40
Scrap rails	9.50 to 9.75
Scrap rails	7.25 to 7.50
No. 2 steel	8.50 to 8.75
No. 2 steel	6.15 to 6.40
Brasshills	6.25 to 6.50
Machine shop turnings	3.25 to 3.40
Bundled skeleton, long	6.00 to 6.15
Forge flashings	6.00 to 6.15
Shafting	13.00 to 13.25
Steel car axles	12.50 to 13.00
Cast iron borings, chemical	5.00 to 7.00
No. 1 textile cast	8.75 to 9.10
Store plate	6.25 to 6.50

Per gross ton delivered consumers' yards:

Textile cast	9.25 to 10.00
No. 1 machinery cast	9.00 to 9.50
Store plate	6.00 to 6.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$8.50 to \$9.00
No. 2 heavy melting steel	7.50 to 8.00
Heavy breakable cast	6.75 to 7.25
No. 1 machinery cast	7.00 to 7.50
No. 2 cast	7.00 to 7.50
Store plate	6.75 to 7.00
Steel car axles	13.50 to 14.00
Shafting	13.50 to 13.75
No. 1 railroad wrought	8.50 to 9.00
No. 1 yard wrought, long	7.50 to 8.00
Spec. iron and steel pipe	5.50 to 6.00
Forge fire	6.50 to 7.00
Rails for rolling	9.00 to 10.00
Short shoveling turnings	3.00 to 3.25
Machine shop turnings	3.50 to 4.00
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	10.00 to 11.00
Unprepared yard iron and steel	4.50 to 5.00

Per gross ton, delivered local foundries:

No. 1 machinery cast	\$11.00
No. 1 hvy. cast (cupola size)	9.50
No. 2 cast	8.00

† Loading on barge.
* 25c. higher offered at nearby New Jersey points.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	\$7.50 to \$8.00
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00
Store plates	7.00
Steel axles	7.00 to 7.50
Iron axles	11.50
No. 1 railroad wrought	7.00
Rails for rolling	12.50
No. 1 cast	10.00 to 10.50
Tramcar wheels	10.00

ST. LOUIS

Dealers' buying prices per gross ton delivered consumers' works:

Selected heavy steel	\$10.50 to \$11.00
No. 1 heavy melting	10.50 to 11.00
No. 2 heavy melting	9.00 to 9.50
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	11.50 to 12.00
Bundled sheet	12.00 to 12.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 busheling	10.50 to 11.00
Cast iron borings and shoveling turnings	3.00 to 3.50
Rails for rolling	12.50 to 13.00
Machine shop turnings	2.75 to 3.25
Heavy turnings	2.00 to 2.50
Steel car axles	12.50 to 13.00
Iron car axles	13.00 to 13.50
No. 1 railroad wrought	7.00 to 7.50
Steel rails less than 3 ft.	13.00 to 13.50
Steel angle bars	12.00 to 12.50
Cast iron car wheels	9.00 to 9.50
No. 1 machinery cast	11.25 to 11.50
Railroad malleable	13.25 to 13.75
No. 1 railroad cast	9.50 to 10.00
Store plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	\$9.50 to \$10.00
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CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	\$8.00	\$7.50
Rails, scrap	8.50	8.00
Machine shop turnings	3.50	3.50
Boiler plate	5.00	5.00
Heavy axle turnings	4.50	4.00
Cast borings	4.50	4.00
Steel borings	3.00	3.00
Wrought pipe	4.00	4.00
Steel axles	3.00	3.50
Axles, wrought iron	3.00	3.50
No. 1 machinery cast	9.50	9.00
Store plate	6.50	6.00
Standard car wheels	7.75	7.00
Malleable	7.50	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	\$4.30
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	5.00
High phosphorus, 51.50% iron	4.40

Foreign Ore

O.I.F. Philadelphia or Baltimore		Per Unit
low phos., copper free, 55		
58% iron, dry Spanish or		10.50c.
Algeria		
low phos., Swedish, average		
48% iron		10.50c.
basic or foundry, Swedish,		
aver. 65% iron		9.50c.
basic or foundry, Russian,		
aver. 65% iron		9.50c.
Manganese, Caucasian, washed 32%		25c.
Manganese, African, Indian, 44%		22c.
Manganese, African, Indian, 49%		24c.
Manganese, Brazilian, 46 to 48%		30c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered	\$15.50 to \$18.00
Tungsten, domestic, scheelite, delivered	15.00

Per Gross Ton

Chrome, 45% Cr ₂ O ₃ , lump, c.i.f. Atlantic Seaboard (African)	\$17.50
45 to 48% Cr ₂ O ₃ (Turkish)	16.50 to 16.50
48% Cr ₂ O ₃ (African)	20.50
48% min. Cr ₂ O ₃ (Turkish)	19.25
Chrome concentrate, 50% and over Cr ₂ O ₃ , c.i.f. Atlantic Seaboard	22.00
52% Cr ₂ O ₃ (Turkish)	21.75
48 to 49% Cr ₂ O ₃ (Turkish)	19.25

Fluorspar

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all-rail shipment	\$18.00
Same grade for Ohio River barge shipment for Kentucky and Illinois	17.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	17.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	20.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	\$3.00 to \$3.75
Foundry, f.o.b. Connellsville Prompt	4.25 to 5.75
Foundry, by-product, Chicago ovens, for delivery outside switching district	9.00
Foundry, by-product, delivered in Chicago switching district	9.75
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	9.24 to 9.72
Foundry, by-product, Phila.	9.03
Foundry, by-product, Cleve-land, delivered	9.75
Foundry, Birmingham	6.00

Foundry, by-product, St. Louis, f.o.b. ore \$8.00 |

Foundry, by-product, del'd St. Louis 9.00 |

Foundry, from Birmingham, f.o.b. cars docks, Pacific ports 14.75 |

Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	\$1.00 to \$1.50
Mine run coking coal, f.o.b. W. Pa.	1.90 to 2.10
Gas coal, % in. f.o.b. Pa. mines	2.00 to 2.50
Mine run gas coal, f.o.b. Pa. mines	1.90 to 2.10
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.30 to 1.45

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.25c.
No. 4 industrial	3.97 1/2c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.25c.
No. 4 industrial	3.97 1/2c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	4.75c.
No. 5 industrial fuel oil	3.75c.

Per Gal. f.o.b. Cleveland

No. 3 distillate	5.25c.
No. 4 industrial	5.13 1/2c.
No. 5 industrial	4.00c.

REFRACTORIES

Fire Clay Brick

Per 1000 f.o.b. Works

High-heat intermediate	Duty Brick	Duty Brick
Pennsylvania	\$45.00	\$40.00
Maryland	45.00	40.00
New Jersey	50.00	45.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$45.00
Chicago District	54.00
Birmingham	55.00
Silica clay, per net ton	8.00

Chrome Brick

Per Net Ton

Standard, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	\$45.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	45.00

Magnesite Brick

Per Net Ton

Standard, f.o.b. Baltimore and Chester, Pa.	\$35.00
Chemically bonded, f.o.b. Baltimore	55.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa.	\$45.00
Domestic, f.o.b. Baltimore and Chester	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates, 1/4 in. and heavier	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.95c.
Reinforcing steel bars	3.20c.
Cold-finished and screw stock:	
Rounds and hexagons	3.20c.
Squares and flats	3.20c.
Hoops and bands under 1/4 in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.35c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count	65 per cent off list.
Machine bolts, 100 count	65 per cent off list.
Carriage bolts, 100 count	65 per cent off list.
Nuts, all styles, 100 count	65 per cent off list.
Large rivets, base per 100 lb.	\$3.50
Wire, black, soft ann'l'd, base per 100 lb.	\$2.70
Wire, galv. soft, base per 100 lb.	\$2.925
Common wire nails, per keg	\$2.834
Cement coated nails, per keg	\$2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lbs.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars, rounds	3.00c.
Soft steel bars, squares and hexagons	3.15c.
Cold-fn. steel bars:	
Rounds and hexagons	3.35c.
Flats and squares	3.35c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
Rivets, boiler (keg lots)	3.75c.
Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	\$7 1/4
Cut point set screws	80
Flat head bright wood screws, 50 and 20	55
Store bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	\$7 1/4
Wrought washers	\$4.50 off list
Black ann'l'd wire per 100 lb.	\$3.85
Com. wire nails, base per keg	2.95
Cement c'd nails, base per keg	2.95

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb. the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, rounds	3.31c.
Iron bars	3.26c.
Iron bars, swed. charcoal	6.75c. to 7.00c.
Cold-fn. shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	3.81c.
Cold-rolled; strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheets (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24)*	3.89c.
Galvanized sheets (No. 24)*	special
Long fern sheets (No. 24)	5.25c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x 1/4 in. and larger	3.75c.
Open heart spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	\$3.21
Machine bolts, square head and nut:	
All diameters	70 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10

Roller tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.95
Seamless welded, 2-in.	19.34
Charcoal iron, 2-in.	24.34
Charcoal iron 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.45c.
Bars, soft steel (rounds and flats)	3.25c.
Bars, soft steel (squares, hexagons, oval half ovals and half rounds)	3.40c.
Cold-fn. rounds, shafting, screw stocks	3.90c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.90c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fittings up bolts, bolt ends, pivot bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	3.03c.
*Reinforce. steel bars, sq. twisted and deformed	2.96c.
Cold-finished steel bars	3.01c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
Hot-rolled anneal. sheets (No. 24)	3.65c.
Galvanized sheets (No. 24)	4.40c.
*Hot-rolled annealed sheets (No. 10)	3.09c.
Diam. pat. floor plates, 1/4 in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	3.00c.
Reinforce. steel bars	2.10c.
Cold-finished steel bars	3.25c.
Flat-rolled steel under 1/4 in.	3.36c.
Cold-finished strip	3.90c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.81c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
*Black ann'l'd wire, per 100 lb.	\$2.75
*No. 9 galv. wire, per 100 lb.	3.10
*Com. wire nails, base per keg	2.70

*Outside delivery 10c. less.

†For 5000 lb. or less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.42c.
Bars, rounds, flats and angles	3.22c.
Other shapes	3.37c.
Roll steel reinforce. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.57c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg	3.04
Any quantity less than carload	3.50
Cement c'd nails, base 100-lb. keg	3.35
Chain, lin. per 100 lb.	8.35
Seamless steel boiler tubes, 2-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.32

BUFFALO

	Base per Lb.
Plates	3.38c.
Struc. shapes	3.25c.
Soft steel bars	3.08c.
Reinforcing bars	2.60c.

Cold-fn. flats and sq.	3.40c.
Rounds and hex.	3.40c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets (3/16 in. 24 to 48 in. wide)	3.63c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	\$3.35
Black wire, base per 100 lb. (2500-lb. lots or under)	3.55
(Over 2500 lb.)	3.45

BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.54c.
H. beams and shapes	3.54c.
Plates—Sheered, tank and univ. mill.	3.54c.
1/4 in. thick and heavier	3.54c.
Floor plates, diamond pattern	3.56c.
Bar and bar shapes (mild steel)	3.45c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.70c.
Tire steel	4.70c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.75c.
B'ue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24	5.20c.
Galvanized steel sheets, No. 24 ga.	5.90c.
Lead coated sheets, No. 24 ga.	6.85c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.09c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Soft steel sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)	4.72c.
Bands	3.39c.
Hoops	3.39c.
Cold-finished bars	3.49c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100)	5.29c.*
Bolts and nuts	70 and 5 per cent off list

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.

*Price applies to 1,000 lb. and over.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars, rounds up to 8 in.	3.11c.
Flats and fillet angles	3.11c.
Soft steel bars, squares and hexagons	3.26c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 20)	4.66c.
Cold-finished steel bars	3.46c.
Cold-rolled strip	3.33c.
Structural rivets (hex lots)	3.96c.
Boiler rivets, cone head (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.25c.
Com. wire nails	2.95c.
Cement coated nails	2.95c.
Machine bolts	70 and 10
Carriage bolts	70 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	70 and 10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	2.25c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	3.87c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.96c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On cold-finished bars, hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over.

BALTIMORE

	Base per Lb.
*Mild steel bars	2.95c.
*Iron bars	2.95c.

*Reinforcing bars	2.95c.
*Structural shapes	2.90c.
*Plates	2.90c.
*Hot-rolled sheets, No. 10	3.10c.
*Hot-rolled annealed sheets, No. 24	3.60c.
*Galvanized sheets, No. 24	4.30c.
*Bands	3.30c.
*Hoops	3.45c.
*Cold-rolled rounds	3.58c.
*Cold-rolled squares, hex. and flats	3.58c.
*Rivets	4.40c.
*Bolts and nuts, per cent off list	.60 and 10

*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base: 1500 lb. to 1999 lb. add 15c. per 100 lb.; 1000 lb. to 1499 lb. add 30c.; 0 to 999 lb. add 50c.

‡50 bundles add 50c. per 100 lb. for 10 to 49 bundles add 55c.

§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add 75c.; for 0 to 299 lb. add \$1.25.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.31c.
Iron bars	3.31c.
Reinforcing bars	3.31c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.39c.
Hot-rolled annealed sheets, No. 24	4.21c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	3.98c.

MEMPHIS

	Base per Lb.
Mild steel bars	3.47c.
Shapes, bar size	3.47c.
Iron bars	3.47c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.97c.
Steel bands	3.72c.
Cold-drawn rounds	3.99c.
Cold-drawn flats, squares, hexagons	5.89c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	65
Small rivets, per cent off list	50

NEW ORLEANS

	Base per Lb.
Mild steel bars	3.35c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10	3.55c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.95c.
Cold-finished steel bars	4.15c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	\$3.05
Bolts and nuts, per cent off list	70

PACIFIC COAST

	Base per Lb.	San Fran.	Los Angeles	Seattle
Plates, tank and U. M.	3.50c.	3.60c.	3.55c.	3.50c.
Shapes, standard	3.50c.	3.60c.	3.55c.	3.50c.
Soft steel bars	3.50c.	3.60c.	3.55c.	3.50c.
Reinforcing bars	3.50c.	3.60c.	3.55c.	3.50c.
f.o.b. cars dock				
Pacific ports	2.45c.	2.45c.	2.45c.	
Hot-rolled annealed sheets (No. 24)	4.25c.	4.35c.	4.40c.	
Hot-rolled sheets (No. 10)	3.60c.	3.70c.	3.75c.	
Galv. sheets (No. 24)	5.00c.	4.95c.	5.00c.	
Cold finished steel rounds	5.80c.	5.85c.	6.00c.	
Squares and hexagons	7.05c.	7.10c.	7.25c.	
Flats	7.55c.	7.60c.	8.25c.	
Common wire nails—base per keg less carload	\$3.20	\$3.20	\$3.20	

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Steel Rate Unchanged at 69 Per Cent at Cleveland



Advances of \$2 a Ton on Semi-Finished and \$1 a Ton on Finished Steel Expected—Ore Shipments Are Heavy

CLEVELAND, Nov. 5.—Ingot output in the Cleveland-Lorain territory is unchanged this week at 69 per cent of capacity. One open-hearth furnace was put on in Lorain and one was taken off in Cleveland. Finishing mill operations in this territory show little change.

Interest is centered in pending price revisions. An advance of \$2 a ton on semi-finished steel probably will be announced this week and this is expected to be followed by a \$1 a ton advance on finished steel. The forging billet base probably will be left unchanged, as this was marked up \$3 a ton last August. However, some revision of the classification seems probable, as strong objections have been made by forgers to the recent placing of 5 by 5-in. billets on a bar base, increasing the cost of forgings to such an extent that in some cases buyers have substituted steel castings for forgings.

A good volume of new business, particularly in sheets, is coming from the automotive industry, although there is no marked increase in orders from that source. Miscellaneous demand for finished steel continues fair. However, not much business is coming from such capital goods industries as crane and power shovel builders. Railroad orders are very light.

Some of the smaller consumers of finished steel who previously had made no commitments for the quarter are now placing contracts, evidently because of the probability of price advances.

The pig iron market has been inactive since the price advance, although small sales have been made at the higher prices.

Shipments of Lake Superior ore during October were heavier than had been expected and the season's movement by water will be approximately 28,000,000 tons.

Scrap is showing more life, and blast furnace grades weaker.

Pig Iron

Lake furnaces have made a few small-lot sales since the \$1 a ton

price advance. However, as nearly all consumers are covered for the quarter, new business is expected to be very light until books are opened Dec. 1 for the first quarter. Some of the larger buyers are believed to have bought enough iron to carry them well into the next quarter. Smaller consumers have confined their purchases more to their expected requirements. With recent heavy bookings and the price advance, producers seem assured of heavy shipping orders during November and December. Furnaces may cancel low-priced iron under contract not taken by Dec. 31. No advance has been announced as yet on silvery iron, but this is expected shortly. Southern iron for delivery to points affected by the advance on northern grades has automatically gone up \$1 a ton, as the price of southern iron is regularly established at 38c. a ton below the delivered price from the nearest northern baring point.

Sheets

Demand from the automotive industry is heavy, and miscellaneous specifications continue good. Enameling sheets are moving in good volume to manufacturers of household equipment, and electrical sheets also are very active. There is a good call for tin mill black from manufacturers of kitchen utensils. Only small orders are coming from manufacturers of refrigerators. Demand from the barrel manufacturers has slumped. Some mills cannot promise deliveries of full-finished sheets within four or five weeks, and some consumers are scheduling their shipping orders further ahead in order to be sure of deliveries. Local sheet mills continue to operate at capacity and the Lake district plant of a Cleveland mill is operating at 80 per cent of capacity.

Strip Steel

New business and specifications from the motor car industry are fair and cold rolling mills are issuing liberal releases for hot-rolled strip. Miscellaneous demand is light. The local cold strip mill is maintaining its operating schedule of 60 per cent of capacity.

Bars, Plates and Shapes

Forge shops doing automobile work continue to place good orders for bars, and some are reported to be building up stocks in anticipation of higher prices. Demand from bolt and nut manufacturers is also good, and business in fair volume

TRIPLE COMPRESSION SCRAP BALERS



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100 TC
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Put shatter-proof MARVEL High-Speed-Edge Blades on every power saw and enjoy uninterrupted service at *capacity*—maximum production from every machine.

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is coming from manufacturers of agricultural implements and road scrapers and from makers of products used in the building field. In the construction field there is a fair amount of small building work, but little new inquiry of any size. The Erie Railroad has an inquiry out for grade crossing elimination in Endicott, N. Y., taking 200 tons, and the New York highway department has taken bids for 400 tons for Erie Railroad grade crossing elimination in Olean. Reinforcing bars are quiet. Demand for plates is slow.

Iron Ore

Water shipments of Lake Superior ore this season will amount to 28,000,000 tons and possibly a little more, according to late estimates. This figure is somewhat higher than estimates made a month ago, which have been revised because the October movement was considerably larger than had been looked for. Shipments in October were 4,600,661 tons, or only 216,953 tons less than in the previous month. The October movement was 1,959,838 tons greater than during the same month last year. Total shipments until Nov. 1 were 26,804,874 tons, a gain of 5,039,465 tons or 23.15 per cent over the same period last year. Good weather conditions were somewhat of a factor in keeping the October shipments close to those in September. The Pittsburgh Steamship Co., subsidiary of the United States Steel Corp., shipped its last ore cargoes for the season

early this week. Other shippers have not set their closing date and some will continue to move ore until near the end of November.

Scrap

Some consumer demand has developed after several weeks of inactivity and has furnished a test of prices, which indicates that heavy melting steel is firm and blast furnace scrap is weak, this softening being attributed to the shipment of considerable of this grade to Cleveland from Detroit. This movement has increased because of the approach of the close of the season of navigation. Blast furnace scrap and some other grades have declined 25c. a ton. A local mill paid \$8 for a small tonnage of blast furnace scrap and refused to make another purchase at the same price. Another local mill bought a small tonnage of No. 1 heavy melting steel at \$12.75, an advance of 15c. a ton over its previous purchase and a Valley district consumer purchased a small tonnage at \$13.50. Dealers are paying \$12.25 to \$12.50 for No. 1 heavy melting steel for Cleveland delivery and \$13 to \$13.25 for delivery to Valley mills.

Steel Demand Rising In Canada

TORONTO, Ont., Nov. 5.—General business in the Canadian iron and steel industry has been showing steady expansion since the beginning of this year, with the

greatest improvement in the past couple of months. The output of pig iron in the nine months ended with September was 50.1 per cent higher than in the corresponding period of last year. Further expansion in business and production is under way and it is believed that the last quarter will exceed that of any previous quarter this year. Steel mills now are rolling rails for the Canadian National Railway, totaling 80,000 tons, and in addition the Dominion Steel & Coal Corp., Sydney, N. S., recently completed some 15,000 tons of rails for the South African Government. Car and locomotive shops are busy on contracts recently placed for the Canadian National and Canadian Pacific railroads. The automotive industry is preparing for record production of 1936 car models. Mining operations are picking up to some extent and there is a steady demand for steel and equipment from this source. Building trades, however, continue dull, with no large projects in sight.

In the merchant pig iron markets business is increasing at a steady rate. The daily melt is reported at about 50 per cent of capacity. Pig iron production also is holding at its peak level for the year, with four stacks blowing and output running around 55,000 tons monthly. Prices are unchanged.

Scrap prices are firm at recently revised levels.

Sharp Drop in Buffalo Output

BUFFALO, Nov. 4.—A sharp cut in operations at the Bethlehem Lackawanna plant has reduced the number of active open-hearth from 12 to nine. From present indications, nine will be in operation all this week. Republic Steel Corp. is operating four and Wickwire Spencer Steel Co., one. The Seneca sheet division of Bethlehem continues to operate practically at full capacity.

The price of pig iron at Buffalo was increased \$1 a ton last Friday. The increase followed extensive and heavy anticipatory covering by district melters. Substantially all foundries are now covered until the end of the year, though producers say there was an absence of speculative buying, with purchasing based on expected maximum needs. Business, producers say, is on the increase and a good quarter is expected.

Twenty-five or 30 school jobs, to be erected with Government aid, are being planned throughout this part of the State. Most of the jobs

range from \$50,000 to \$200,000 in cost, and will call for substantial tonnages of reinforcing and structural steel. The Fleisher Engineering Co., St. Paul, Minn., is successful bidder on the new post office in Buffalo, which will require 2500 tons of structural and 240 tons of reinforcing. The Niagara Falls sewage disposal plant will require 800 tons of reinforcing bars, and the Buffalo sewage disposal plant, which now seems to be nearer realization, will require a much larger tonnage of bars. A large Federal housing project in Buffalo will require possibly 300 or 400 tons of reinforcing bars.

Since the large purchasing of scrap by the principal district consumer, reported last week, there has been one important sale, 5000 tons at \$11.50 for the No. 1 steel and \$10 for the No. 2 steel. This sale followed on the heels of heavier selling at \$12 and \$10.50 to the same interest. This mill is now holding up shipments.

Pig Iron Buying Heavy in South

BIRMINGHAM, Nov. 5.—Birmingham furnaces have lately booked more pig iron than at any other period this year. There has been a substantial buying movement in progress, due partly to the continuation of the coal strike and also to the expectation of a price advance. The coal strike in Alabama, in progress since Sept. 23, is still deadlocked, with both sides standing firm and no prospects yet of early settlement. Were it not for this strike one or two additional merchant stacks would be in operation. Birmingham quotations are unchanged on a base of \$14.50, but it is believed there will be an advance for the first quarter, with announcement to be made some time this month.

Shipments have also increased but not to the same extent as bookings. It is likely that some foundries are buying at present prices with the expectation of taking the iron late in December for requirements in the first quarter.

The Ensley rail mill will resume operations Nov. 7 for eight and one-half weeks' operations, with 33,000 tons of rail to be rolled. The Louisville & Nashville has bought 20,000 tons for immediate rolling. One Ensley blast furnace was blown in Oct. 31. The total number of active stacks for the district is now eight. Another Ensley stack will be blown in Wednesday.

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Manufacturers of Cold Drawn Steels
Turned and Polished Shafting Turned and Ground Shafting

Steel tonnage continues satisfactory. Structural and bar business is coming in at a steady rate. After a lull during most of October, the demand for sheets and wire products is again ascending. The outlook for bars and structural steel is especially good on account of the large volume of PWA and grade

separation projects now being placed under contract.

Fourteen open-hearths were worked most of last week. Tennessee Coal, Iron & R. R. Co. had all nine of its Fairfield units in operation most of the week, while Gulf States Steel had five. The schedule this week calls for 11, six at Fairfield and five at Alabama City.

Eastern Pennsylvania Rate Holds at 40 Per Cent



Steel Sellers Look for Higher Prices
in First Quarter—Local Firms Se-
cure Tonnages From Navy

PHILADELPHIA, Nov. 5.—All district sales offices report a moderate tonnage on books, much of which has come in within the past week from consumers seeking protection against the first quarter price advances, which now seem a certainty. Even more protective tonnage is expected to be forced in after the first of December. However, this forward buying will not be in the volume it would have been if price revisions had been inaugurated at any other time, since users wish to keep inventories low for the year-end period.

The \$1 rise in pig iron last week is judged by most of the trade to portend advances in finished and semi-finished lines for delivery after the first of the year. No company has made an announcement to this effect, but consumers in general consider the action inevitable, even though many of them are not in sympathy with the move. If sheet bars are raised \$2 and finished steel only \$1, as is forecast in

some quarters, non-integrated mills will suffer severely and will probably blame larger mills with deliberate intent to cripple their operations.

Steel production in this area is holding at approximately 40 per cent of capacity, and mills here see no indication that operations will be advanced or decreased to any significant extent through the turn of the year. Heavier railroad purchases now seem likely and a larger volume of shapes and reinforcing bars for city schools and State highways is expected to mature in the next few months. This influx of heavier products will be particularly opportune, as it will take the place of automobile tonnage and miscellaneous demands, which tend to fall off at that time. On this basis, producers here look for and will probably be content with an average of 40 per cent in the first quarter.

Pig Iron

All grades are up \$1 a ton. Con-

sumers have not been pinched by the rise as yet, since all sellers gave their customers sufficient notice to enable them to cover their year-end requirements on the old price basis. Sellers state that they have ignored demands for first quarter protection at the old price. October was the best month this year for pig iron bookings, which totaled about 45,000 tons. Deliveries on these orders have so far been in good volume, and practically the entire tonnage is expected to be shipped by the end of the year. As in all rising markets, consumers are endeavoring to get lower-priced material. Several foreign brands are in greater demand, and a number of foundries are turning to even greater percentages of scrap in their melts.

Bars, Plates and Shapes

Several district mills fared well in the Oct. 15 Navy openings in Washington. Central Iron & Steel Co. will furnish 2200 tons of plates, sheets and strip, A. M. Castle & Co. secured 300 tons of galvanized plates, Lukens received 150 tons of high-tensile plates, and Bethlehem and Carnegie shared in a 350-ton award of bars and strip. The disposition of other Navy bids has not yet been announced. The only other shape award during the week involved 660 tons for warehouses of Ludlow Mfg. & Sales Co. to Robinson Steel & Iron Co. New reinforcing steel business was confined to 135 tons for a post office in Chester, Pa., awarded to Sweets Steel Co. A considerable amount of construction business is currently pending, and several additional tonnages are up for bidding. The archives building at Washington, requiring 2000 tons of shapes, has been reinstated for bidding on Nov. 25. Bids go in Nov. 9 on 1000 tons of shapes for the Northeast high school and on 150 tons for an elementary school, both in Philadelphia, and plans will soon be released on a junior high school at Scranton, Pa., requiring 800 tons. Four nearby housing projects will soon be awarded, thereby releasing a considerable volume of reinforcing and structural shapes.

The big item of interest in this area is what type of construction program the Pennsylvania Railroad will undertake. As stated last week it is doubtful whether all of the cars will be built in the railroad's shops, for it is understood a good percentage of the work will be let to car builders.

Sheets and Strip

The 200 tons of license plate stock for the State of Pennsylvania was awarded to Bethlehem Steel Co. on a draw. Sheet and strip consumption here is about at a peak,

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with local autobody stamping plants and one radio maker working practically full time. Stove makers also report heavy seasonal operations. From this it is evident that sheet consumption for this area is now at a rate of more than 50,000 tons monthly and this consumption should be maintained until the end of the year. The Budd Mfg. Co. is constructing one stainless steel chair car for the Santa Fe, and it is expected that work will soon be started on two additional full-sized trains for the Burlington.

Warehouse Business

October business was in heavier volume than in any single month for several years. November to date seems to be running on a par with October. In conspicuous demand are flat-rolled products such as galvanized, black and corrugated sheets. Prices are steady and unchanged.

Imports

The following iron and steel imports were received here last week: 1478 tons of pig iron from Soviet Russia; 693 tons of chrome ore from British South Africa; and 103 tons of steel tubes, 51 tons of steel bars, 20 tons of steel wire, 4 tons of steel billets and 3 tons of steel forgings from Sweden.

Scrap

Several weeks ago scrap showed a slight weakness in undertone, but this condition has apparently been altered to some extent. Brokers are less willing to consider price concessions, inasmuch as they are now convinced that melt will be sustained through the turn of the year and mills will be forced into the market. All district mills are currently holding up No. 1 shipments, but No. 2 orders have been fairly well cleaned up. Several other less important grades are in steady demand, for example, cast material, which foundries are using more and more in preference to higher-priced pig iron, and turnings, for which some users are willing to pay as high as \$7.75. The export situation is unaltered. Old contracts are either liquidated or being held up awaiting cheaper freight rates, and new business with the Orient and northern European countries has failed to materialize in the volume that inquiries had led brokers to expect. The major domestic independent buyer, Bethlehem Steel Co., continues to purchase No. 1 for Steelton at \$11.50 delivered, and is willing to pay \$11 for No. 1, delivered Bethlehem, from adjacent dealers, but will lift the price by 50c. for tonnage from greater distances.



Our sheets must carry a better finish. Our rolls must, therefore, carry a better finish. There you have the unanimous decision of the steel industry.

Meeting this demand for better finish is the Landis Type 30 Roll Grinder. Not by accident but by well thought-out design it is playing its part in the turning out of better sheets in more than one mill. Multiple V belt work drive, all electric control, a crowning and concaving mechanism that produces symmetrical contours and force feed lubrication to guide-ways and spindles are only some of the features making for such satisfactory results.

If you are striving for better roll finishes but are not getting them turn to the Landis Type 30. If your present Roll Grinder capacity is over-taxed turn to the Type 30 Landis. If you think we are too enthusiastic about this machine, at least ask us for a copy of catalog H-301. We suspect it will interest you more than just a little.

177

LANDIS TOOL CO.
WAYNESBORO, PA.

Pipe Lines

Taft, Tex., plans steel pipe lines for natural gas distribution. Cost about \$40,000. J. E. Ward, Harvey Snider Building, Wichita Falls, Tex., is consulting engineer.

Deming, N. M., plans steel pipe lines for natural gas distribution. Fund of \$40,000 has been secured through Federal aid.

Rodessa Oil & Refining Co., Cedar Grove, La., plans welded steel pipe line from Rodessa, La., oil field district to point near Cedar Grove, about 40 miles.

General Purchasing Officer, Panama Canal, Washington, asks bids until Nov. 18 for 1040 ft. black welded steel pipe; also for 72,840 ft. galvanized welded steel pipe, ¾ to 2 in. diameter, and 3 to 9 in. diameter (Schedule 3102).

Superior Oil Co., 601 West Fifth Street,

Los Angeles, plans new welded steel pipe line from tank farm in Kettleman Hills, Cal., oil field district to point near Stockton, Cal., for crude oil. It will have rated capacity of about 6000 bbl. per day.

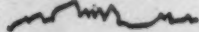
Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 19 for steel pipe; also steel tubing and wrought iron pipe (Schedule 6413) for Eastern and Western Navy yards.


Tacoma, Wash., has let contracts to Steel Tank & Pipe Co., Portland, and American Concrete & Steel Pipe Co., Tacoma, for steel pipe for main water line from Green River to city, at \$195,838 and \$102,723, respectively.

Coutts Gas Co., Ltd., Coutts, Alta., plans welded steel pipe line from natural gas fields in Montana for gas supply at Coutts, where steel pipe line distributing system will be installed; also a distribution plant and other operating facilities. Cost over \$100,000.

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Heavy Pig Iron Sales Made At Cincinnati

CINCINNATI, Nov. 5.—An advance of \$1 a ton on northern iron prices, effective Nov. 1, was preceded by heavy ordering to cover for the remainder of the quarter at lower quotations. District furnace representatives report new orders in excess of 5500 tons, of which one southern Ohio consumer took 1000 tons. Southern iron, while momentarily expected to follow the price trend, was not in as active demand as northern. Total bookings of southern producers were about 700 tons, all of which was in small amounts. The new quotation on Hamilton, Ohio, foundry iron, delivered in Cincinnati, is \$20.5807, with the usual differentials on basic and Bessemer grades.

The specter of price advances on finished sheets stimulated ordering for the remainder of the quarter, although no formal announcement of an increase in quotations was made. Demand was in excess of 100 per cent of capacity for the second week and mills are now carrying backlogs, which are rapidly assuming substantial proportions. Automotive specifications continue in good volume while miscellaneous demand is expanding slightly. Ingot production in the district is unchanged, operations standing at 85 per cent.

Warehouse business in October moved to a level higher than in September as a result of further expansion of industrial demand. Pending Government projects, in this area, are expected to stimulate construction demand.

The district scrap market is characterized solely by dealer activity. Ordering is small, mills refusing to make substantial commitments at present offerings. Yard supplies are heavy, but are being held.

Railroad Equipment

Wabash Railway has been authorized by the court to repair and rebuild 150 hopper coal cars at a total cost of approximately \$100,971.

Atchison, Topeka & Santa Fe has ordered one light-weight chair car of Cor-Ten Steel from St. Louis Car Co.

Pennsylvania will build 10,000 freight cars and rebuild 1000 cars. Part of this equipment will be constructed in the company's own shops and the remainder will be purchased.

Chicago Surface Lines have ordered 15 trolley buses from St. Louis Car Co.

New York Central is repairing 1500 cars in its Buffalo and Avis, Pa., shops.

Milwaukee Road is contemplating purchase of 15 locomotives.

RAILS

Louisville & Nashville has ordered 20,000 tons of rails from Tennessee Coal, Iron & Railroad Co.

LEADERSHIP THAT STANDS THE TEST IN CRANE MANUFACTURING

A large tonnage order received by an Indiana steel plant demanded urgent delivery on a 15-ton crane with 100-foot span for continuous strip mill operation. Every day without it meant increased production costs.

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Without such advanced production equipment, delivery could not have been made in double the time. As America's foremost builder of overhead traveling cranes, Harnischfeger offers you experience, cooperation and every facility to meet your problems — use this service.

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PH TRAVELING & CO. CRANES

Pig Iron Prices Up \$1 a Ton at New York



Billets and Skelp Slated to Go Up \$2 a Ton—Railroad and Construction Work in Rising Volume

NEW YORK, Nov. 5.—Advances of \$1 a ton on pig iron, coupled with recent advances in fuel costs and prospective wage increases at the mills, have centered attention on the possibility of higher steel prices. An upward revision of \$2 a ton on billets and skelp is considered a certainty, but there is as yet little definite information on finished steel products, although a general advance is regarded as likely before next quarter. Next year's quotation for tin plate is also coming up for consideration at this time, since contracts for the first nine months of 1936 will soon be before the trade. Price irregularities have not yet entirely disappeared. In fact, the concrete bar market is still in a decidedly unsettled state. However, the certainty of increased costs is counted on to give prices increasing stability and strength. Already there is some buying in anticipation of higher prices in the first quarter. On the whole, however, bookings of finished steel are not as large as a week or two ago. Tin plate business has shown a particularly sharp decline in line with seasonal expectations.

Revival of demand for heavier rolled products is the most encouraging development of the market. There is a growing volume of large structural projects, as well as smaller jobs, most of them growing out of the Federal works relief program. In addition, the railroads are becoming more important factors. The New York Central has reopened its Buffalo and Avis, Pa., shops to repair 1500 cars. The Pennsylvania will build and buy a total of 10,000 cars and will rebuild 1000 cars, besides purchasing 100 locomotives.

The George J. Atwell Foundation Corp., New York, has been awarded track depression work for the New York Central between West Thirty-fourth and Forty-second Streets, Manhattan, requiring 1500 tons of structural steel and 300 tons of reinforcing bars. That railroad will take bids Nov. 22 on track depression work at Seventy-ninth Street, calling for more than

6000 tons of steel, including 4300 tons of structural steel, 1500 tons

of concrete bars and an odd tonnage of miscellaneous items. The deck for the main span of the Triborough bridge, New York, the last job to be let for that structure, will be out for figures shortly. A substantial tonnage of steel is involved.

Bids for foundation and substructure work will be taken Nov. 19 for the Macombs Place housing project in Harlem, and on Nov. 27 for the Williamsburg section of the Brooklyn housing project. Tenders will be received by the Emergency Works Administration, Housing Division, United States



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ANALYSIS

Cr. 18%

Ni. 8%

Mo. 2.5%

C. .07%

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Government. Requests for bids will follow shortly on the super-structures for these projects, which will call for large quantities of structural steel and concrete bars.

Foreign flat bars are being sold at as low as 1.85c. a lb., delivered by truck in the metropolitan area, with quantities as small as one-half a ton selling as low as 2.05c. a lb. Second-hand structural steel from the Chicago World's Fair is being sold in a wide range of sizes at as low as 1.50c.

Makers of steel drums for export are considering using foreign steel, since 90 per cent of the duty is remitted when imported steel is used for products for export. Apparently American mills have not yet met drum manufacturer's ideas of prices. Annual exports of drums involve about 8000 tons of sheets. In the case of plates, export prices are in line with competitive conditions; on sales of plates to Canada in sizes and qualities not made in that country the ruling base price is 1.45c., Pittsburgh.

Pig Iron

Prices were uniformly written up \$1 a ton in this district, effective Nov. 1, on all standard grades, while low phosphorus iron was advanced 50c. a ton. Of especial interest to the trade was the announcement that sellers of Royal Dutch pig iron met the domestic change by raising their quotations an equal amount. In the final

buying movement last week, about 8850 tons was sold as against 9300 tons for the preceding period. The market now is consequently oversold, and until next quarter's books are opened little or no buying should develop. Occasional carlot orders for high silicon and low phosphorus grades will naturally continue to be placed, but only fill-in lots of standard irons are likely to be ordered.

Reinforcing Steel

As a consequence of the success of certain consumer interests in easing prices lately, others are now actively shopping around to obtain concessions. Contracts placed last week were light, though inquiry continues heavy. A recent consistent purchaser has been the procurement division of the Treasury, which has awarded 274 tons for a WPA project at West Brighton, N. Y., to W. Ames & Co., Jersey City. An award of 350 tons for an incinerator at New York went to Carroll-McCreary Co. The proposed joint sewer project between Manhattan and the Bronx, it is estimated, will call for approximately 3000 tons.

Scrap

Higher pig iron quotations and talk of advanced prices for semi-finished steel have given the scrap market in this district a much stronger tone. Cast grades are by no means plentiful at the prices brokers are willing to pay, and the quoted buying figures are being

bettered slightly in some instances. No change is apparent in the steel making grades, but the increased range between scrap and basic pig iron has given dealers a more optimistic outlook. The export market continues dull, with negotiations for foreign sales held up by insurance difficulties and scarcity of bottoms. United States brokers would like to ship material abroad on an f.o.b. American port, basis, but have been able to do scarcely any business in that manner as yet.

Mystic Pig Iron Price Is Advanced

BOSTON, Nov. 5.—On Nov. 1, Mystic Iron Works' pig iron prices, as well as those on Buffalo and eastern Pennsylvania brands consumed in New England advanced \$1 a ton. Indian iron also was raised \$1 a ton. In the four business days before that date approximately 4000 tons of iron were sold. Additional tonnages were under negotiations when the advance went into effect. This business is now inactive. Foundries who do not take contracted iron on or before Dec. 31, next, will be obliged to cancel or rewrite contracts. Two or three are busy with machine tool builders' orders, but New England jobbing foundries generally are doing little. Other foundries, however, are gradually increasing weekly melts, with prospects of greater activity as 1935 winds up. Indian iron with 2 to 2.25 per cent silicon is now \$20.50 a ton on dock, and \$21.50 delivered within switching districts.

A steamer cleared here the past week with scrap for Italy, and another has started loading 4500 tons for that country. Another steamer probably will be chartered to load around 4000 tons for Italy shortly. A steamer at Providence, R. I., is loading 1700 tons, presumably for Scotland. For No. 2 steel for export \$8.50 to \$8.75 a ton delivered dock is being paid, generally \$8.75. No. 1 steel is \$9.50 to \$9.75 a ton delivered, but is not moving in quantities. Steel turnings for the Pittsburgh district have declined 25c. a ton, but demand for that delivery is not a market factor because exporters are paying \$5.25 to \$5.50 a ton delivered dock. Cleaned engine blocks for export are \$8.25 a ton delivered dock, and uncleaned \$7.25. The American Steel & Wire Co., Worcester, Mass., is hardly a market factor, recent purchases being confined to carlots of No. 1 steel at \$9.25 a ton delivered. Foundries the past week took limited tonnages of machinery cast at \$9.25

to \$10 a ton delivered, mostly \$9.50.

With 1027 tons under negotiation and more in prospect, the cast iron pipe outlook is better, and fabricated structural steel tonnages are coming out more frequently.

In contrast with the closing of Boston & Maine Railroad shops, the Boston & Albany Railroad has reopened its West Springfield, Mass., locomotive repair shops, closed since Sept. 2. Between 400 and 500 men are affected.

Large Purchase of Scrap at St. Louis

ST. LOUIS, Nov. 5.—Now that all makers of Northern and Southern pig iron have advanced their prices \$1 a ton for the fourth quarter, the buying movement which preceded that advance has entirely subsided and the market is quiet. With the possible exception of a spot car or two, melters are not expected to buy any more pig iron during the remainder of this year, having covered their requirements prior to the recent advance. Shipments for the next two months are expected to be heavy. It is expected that melters will take in all of the iron they have bought for delivery this last quarter, even piling in their yards material that cannot be melted before Dec. 31 to effect a saving, rather than have contracts for unused tonnages automatically abrogated.

After a lull of a week due to inventory taking, the agricultural implement interests in the Tri-Cities and in Peoria have now taken up the production of their spring lines at a high rate of manufacture. The stove industry in Belleville and Quincy is still operating at a peak rate, which is expected to continue until about the middle of December, at least. Jobbing foundries in the district again have stepped up their melt.

All of the seven fabricators of structural steel in the St. Louis industrial district have some work on hand, with an average production estimated at 30 per cent of capacity. Warehouse business for October is reported to have been 25 per cent ahead of the same month a year ago, and about on the same plane as in September of this year, which was an unusually active month. Opening of bids for the highway bridge over the Missouri River at Weldon Springs has been postponed from Nov. 8 to Nov. 15, 4925 tons of structural steel being required. LaSalle Iron Works has been awarded 100 tons for the George Warren Brown Memorial

\$1,347.00 a Day



Not the interest on the national debt, nor the cost of potato crop control enforcement, but the value of the output of a single 2000-lb. ERIE Type M Motor Driven Hammer.

One of our customers (name on request) reports this figure as the twenty-four-hour output of this one ERIE hammer. Deduct material, labor, and overhead, and you will agree that this machine is paying a handsome return on the investment. That's why we tell you ERIE hammers will earn their own way.

You can buy ERIE forge shop equipment without impairment of your working capital in this period of increasing business volume. There is no financing charge, and only normal interest on deferred payments.

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Hall at Washington University. Fruin-Colnon Contracting Co. has been awarded the general contract for the Arsenal Street sewer, requiring 100 tons of reinforcing bars.

An East Side melter bought between 5000 and 6000 tons of heavy melting steel for delivery over the next 60 days from three dealers here. Malleable is very strong and scarce, and the market is 25c. a ton higher, rather on this basis than because of the recent advance of \$1 a ton in the price of pig iron, which

otherwise has not as yet affected the scrap iron market. Nos. 1 and 2 heavy melting steel, and rails for rolling also are 25c. a ton higher and No. 2 railroad wrought is 50c. a ton up. Railroad lists closing this week include St. Louis Southwestern Railway, 20 carloads, and St. Louis-San Francisco, 85 carloads.

Bethlehem Shipbuilding Corp., Quincy, Mass., Fore River works is to install a galvanizing shop to cost \$15,500 without equipment.

October Pig Iron Output Up 7.8 Per Cent

PRODUCTION of coke pig iron in October totaled 1,978,411 gross tons, compared with 1,776,476 tons in September. The daily rate in October, at 63,820 tons, increased 7.8 per cent over the September rate of 59,216 tons.

There were 116 furnaces in blast on Nov. 1, making iron at the rate of 67,655 tons a day, against 104 furnaces on Oct. 1, making iron at the rate of 59,250 tons a day. Twelve furnaces were blown in during the month and none were blown out or banked. The Steel Corporation blew in six furnaces, independent steel companies put in four, and a merchant producer blew in one furnace. An independent steel company blew in a merchant furnace.

Among the furnaces blown in were the following: One Duquesne, one Ohio, one South Chicago (old) and one Gary, Carnegie-Illinois Steel Corp.; one Lorain, National Tube Co.; one Ensley, Tennessee Coal, Iron & Railroad Co.; one Donner and two Haselton, Republic Steel Corp.; one Eliza, Jones & Laughlin Steel Corp.; one Iroquois, Youngstown Sheet & Tube Co., and one Woodward, Woodward Iron Co.

Merchant Iron Made, Daily Rate

	1935	1934	1933	1932
January	3,926	7,800	2,602	6,256
February	6,288	7,071	2,863	7,251
March	7,089	7,197	2,412	7,157
April	8,799	8,838	1,908	8,287
May	8,441	9,099	3,129	4,558
June	7,874	9,499	4,088	6,090
July	8,644	7,880	6,783	3,329
August	8,194	6,043	7,756	3,070
September	10,090	4,986	10,034	3,213
October	11,199	5,765	8,634	4,286
November .....	.....	6,610	7,639	4,435
December .....	.....	4,399	8,358	3,674

Daily Average Production of Coke Pig Iron

	Gross Tons			
	1935	1934	1933	1932
January	47,656	39,201	18,348	31,380
February	57,448	45,131	19,798	33,251
March	57,098	52,243	17,484	31,201
April	55,449	57,561	20,787	28,430
May	55,713	65,900	28,621	25,276
June	51,750	64,338	42,166	20,935
½ year	54,138	54,134	24,536	28,412
July	49,041	39,510	57,821	18,461
August	56,816	34,012	59,142	17,115
September	59,216	29,935	50,742	19,753
October	63,820	30,679	43,754	20,800
November .....	.....	31,898	36,174	21,042
December .....	.....	33,149	38,131	17,615
Year .....	.....	43,592	36,199	23,733

Production of Coke Pig Iron and Ferromanganese

	Gross Tons		Gross Tons	
	Pig Iron*		Ferromanganese†	
	1935	1934	1935	1934
January	1,477,336	1,215,226	10,048	11,703
February	1,608,552	1,263,673	12,288	10,818
March	1,770,028	1,619,534	17,762	17,605
April	1,663,475	1,726,851	18,302	15,418
May	1,727,095	2,042,896	17,541	10,001
June	1,552,514	1,930,133	12,961	10,007
½ year	9,799,000	9,798,313	88,902	75,642
July	1,520,263	1,224,826	13,175	10,188
August	1,761,286	1,054,382	12,735	8,733
September	1,776,476	898,043	15,983	7,100
October	1,978,411	951,062	19,007	9,830
November .....	.....	956,940	.....	8,134
December .....	.....	1,027,622	.....	4,563
Year .....	.....	15,911,188	.....	124,190

*These totals do not include charcoal pig iron. The 1934 production of this iron was 25,834 gross tons.

†Included in pig iron figures.

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		November 1		October 1	
	October (31 Days)	September (30 Days)	Number In Blast	Operating Rate, Tons a Day	Number In Blast	Operating Rate, Tons a Day
New York:						
Buffalo	140,447	101,956	8	4,940	7	3,980
Other New York and Mass.	10,978	12,680	1	355	1	425
Pennsylvania:						
Lehigh Valley	36,487	34,637	3	1,175	3	1,155
Schuylkill Valley	20,683	11,207	2	665	2	510
Susquehanna and Lebanon Valleys	11,818	11,338	1	380	1	380
Ferromanganese .....	.....	.....	0	.....	0	.....
Pittsburgh District	411,895	352,857	23	13,725	21	12,000
Ferro. and Spiegel	10,030	7,181	1	325	1	240
Shenango Valley	35,240	34,182	2	1,135	2	1,140
Western Pennsylvania	54,399	42,961	3	1,755	3	1,560
Ferro. and Spiegel	6,040	5,910	1	195	1	195
Maryland	78,065	76,930	3	2,520	3	2,565
Wheeling District	139,633	128,751	7	4,505	7	4,345
Ohio:						
Mahoning Valley	187,347	173,632	10	7,310	7	5,020
Central and Northern	190,890	174,664	12	6,210	11	5,820
Southern	46,849	40,922	4	1,510	4	1,390
Illinois and Indiana	381,641	355,287	19	13,630	16	11,865
Mich. and Minn.	74,243	71,114	4	2,395	4	2,370
Colo., Mo. and Utah	21,660	21,758	2	700	2	725
The South:						
Virginia .....	.....	.....	0	.....	0	.....
Ferro. and Spiegel	2,937	2,892	1	95	1	95
Kentucky	13,692	24,312	1	440	1	425
Alabama	103,437	91,305	8	3,690	6	3,045
Tennessee .....	.....	.....	0	.....	0	.....
Total	1,978,411	1,776,476	116	67,655	104	59,250

National Steel Earnings Higher

NATIONAL STEEL CORPN. reports net earnings for the third quarter of \$2,287,763, equal to \$1.06 a share, after depreciation, interest and Federal taxes. This compares with net earnings of \$347,199, equal to 16c a share, for the third quarter of 1934.

For the nine-month period ending Sept. 30, 1935, the corporation reports net earnings of \$8,603,758, equal to \$3.99 a share. The nine-month earning figure is after all charges, including a special non-recurring interest expense of \$242,807, amounting to 11c per share, incurred in the second quarter, incident to the bond refunding program. Earnings during the first nine months of 1934 were \$4,582,896, equal to \$2.12 per share.

Roller-Smith Co., 233 Broadway, New York, has appointed Harris-Green Co., Farmers Bank Building, Pittsburgh, as district sales agent for western Pennsylvania, eastern Ohio and West Virginia.

Tin Stocks in United States and Great Britain Are At Record Low Levels

NEW YORK, Nov. 4.—Fresh demand from consumers of copper in this district remains quiet, though the 9.25c. a lb. price level has not weakened. Apparently the occasional reported transactions in secondary metal at quotations below the stipulated price are not disturbing the primary market. For the first two days of November producers' sales totaled 520 tons. In October 66,646 tons was marketed. February books, which were opened last week, failed to attract any buying interest, and possibly the fact that production has recently been increased is, in part, responsible for the calmer attitude among consumers. The rate of domestic consumption, however, as revealed by current shipments, continues to be an encouraging sign. Trading in the foreign market has shown considerable irregularity lately. This morning, at London, electrolytic sold for about 8.80c. a lb., usual Continental base ports.

Tin

Trading in this commodity was as fair last week as the tight position of spot Straits metal at New York would permit. Producers were unable to offer as much spot metal as buyers wanted. On the other hand, buyers consistently refused to take future offerings freely, and some pressure developed. Prices have risen since the preceding period, with spot Straits selling today at New York for 51.75c. a lb., as against 51.00c. a lb. a week ago. Producers, having exhausted their supplies, are out of the picture, however, and what metal has changed hands has been released by consumers from private stocks. Deliveries of tin of all kinds to the United States in October totaled 5355 tons, compared with 5360 tons in the month before. The world's visible supply increased in October by 2645 tons, but failed immediately to affect the shortage here and in London. Domestic stocks at the end of the month totaled only 1389 tons, while in England they were 919 tons. This is the lowest they

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Made in 50 types, in all sizes, but in only 1 quality—the finest that can be made. Each ARMSTRONG WRENCH must pass rigid inspection and tests, must prove worthy of the name "ARMSTRONG" or be destroyed. There are no ARMSTRONG "seconds." This name on a wrench can mean only "highest quality."

Uniform in quality, uniform in finish—black baked enamel with heads ground bright and plainly marked for size, they come with U. S., S. A. E., American Standard, Metric or Whitworth openings. Blanks are always in stock to facilitate fast service on special millings.

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New York Sales Office, 109 Lafayette Street



The Week's Prices. Cents Per Pound for Early Delivery

	Oct. 30	Oct. 31	Nov. 1	Nov. 2	Nov. 4
Electrolytic copper, N. Y.*	9.00	9.00	9.00	9.00	9.00
Lake copper, N. Y.	9.37 1/2	9.37 1/2	9.37 1/2	9.37 1/2	9.37 1/2
Straits tin, spot, New York†	50.75	51.50	51.75	51.75	51.75
Zinc, East St. Louis	4.85	4.85	4.85	4.85	4.85
Zinc, New York†	5.22 1/2	5.22 1/2	5.22 1/2	5.22 1/2	5.22 1/2
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50

*Refinery quotations; price 1/4c. higher delivered in Connecticut.

†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.25c. a lb., delivered.

Aluminum, No. 12 remelt, No. 2 standard, in carloads, 17.00c. a lb., delivered.

Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.

Antimony, Asiatic, 16.37 1/2c. a lb., New York.

Quicksilver, \$74.00 to \$75.00 per flask.

Brass ingots, commercial 85-5-5, 9.00c. a lb., delivered; in Middle West 1/4c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	52.75c. to 53.75c.
Tin, bar	54.75c. to 55.75c.
Copper, Lake	10.25c. to 11.25c.
Copper, electrolytic	10.25c. to 11.25c.
Copper, castings	10.00c. to 11.00c.
*Copper sheets, hot-rolled	16.25c.
*High brass sheets	14.62 1/2c.
*Seamless brass tubes	16.62 1/2c.
*Seamless copper tubes	16.75c.
*Brass rods	13.12 1/2c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	5.00c. to 6.00c.
Lead, bar	6.00c. to 7.00c.
Lead, sheets	8.25c.
Antimony, Asiatic	17.00c. to 18.00c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.50c. to 20.00c.
Solder, 1/2 and 1/2	31.00c. to 32.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	55.25c.
Tin, bar	57.25c.

Copper, Lake	10.25c.
Copper, electrolytic	10.25c.
Copper, castings	10.00c.
Zinc, slabs	6.25c. to 6.50c.
Lead, American pig	5.20c. to 6.50c.
Lead, bar	8.50c.
Antimony, Asiatic	18.50c.
Babbitt metal, medium grade	19.25c.
Babbitt metal, high grade	59.25c.
Solder, 1/2 and 1/2	31.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.87 1/2c.	7.62 1/2c.
Copper, hvy. and wire	6.75c.	7.25c.
Copper, light and bottoms	5.75c.	6.25c.
Brass, heavy	3.87 1/2c.	4.50c.
Brass, light	3.12 1/2c.	3.87 1/2c.
Hvy. machine composition	5.87 1/2c.	6.37 1/2c.
No. 1 yel. brass turnings	5.00c.	5.50c.
No. 1 red brass or compos. turnings	5.50c.	6.00c.
Lead, heavy	3.50c.	3.87 1/2c.
Zinc	2.50c.	2.87 1/2c.
Cast aluminum	12.12 1/2c.	13.25c.
Sheet aluminum	13.25c.	14.75c.

A portrait . . .

is a portrait, no matter what you do with it, and you can't make a novelty out of it without sacrificing the basic factor of resemblance.

But, John Frew has demonstrated by the alchemy of his skill in bringing inert paper and chalk to life that the quality which sets an individual apart from his fellows can be isolated and made to shine from the printed page.

The series of portraits of Blue Ribbon men of the metallurgical industries, begun last year, and still running in THE IRON AGE, is witness to his uncanny skill in rendering what is known as the "speaking likeness."

The portrait of an executive should measure up to the opinion of the man's own associates—anything less would be an affront to them. But, if the portrait is sufficiently life-like, the response will be, as it always has been and always will be, no matter how artistic standards may change, a delighted recognition of an individual who has impressed his contemporaries.

In almost identical words, the response to the different portraits of this series has been: "The members of my family and my friends are unanimous in saying that this is the best likeness of me they have ever seen."

This is the "new slant" which Mr. Frew puts into his work; a likeness which is unhesitatingly called "best" by those in the best position to judge.

Individuals or firms desiring the best possible portrait of someone they wish to honor should address:—

JOHN FREW, 498 West End Ave., New York, N. Y.



have been at any time during the present century. At present the London market is somewhat dull, with standard metal selling there this morning at £223 for spot, and £212 5s. for futures. In the East quotations were at £220.

Lead

Consumption of this metal has continued on a very good scale for the past several weeks, and no indications of a let-down are in sight. It is estimated that October shipments should total from 41,000 to 43,000 tons, with November, perhaps, running equally as high. Currently, November and December are being covered, the extent by which one exceeds the other varying in different quarters. Producers' daily allotments are being disposed of at will among a widely diversified group of customers.

Zinc

The steady depletion in accumulated bookings goes on, and producers are mainly occupied with shipments. New buying is in meager volume, though high-grade sellers have found an outlet for relatively substantial amounts of their product in an enlivened automobile industry. Quotably the

market has not changed, and ore prices, too, are steady. Last week's Prime Western shipments totaled 9850 tons, while stocks at the close of the period were estimated at approximately 20,500 tons.

Non-Ferrous Averages

The average prices of the major non-ferrous metals for October, based on daily quotations in THE IRON AGE, are as follows:

	Average
Electrolytic copper, N. Y.†	8.944c. a lb.
Lake copper, Eastern delivery	9.319c. a lb.
Straits tin, spot, N. Y.	51.251c. a lb.
Zinc, East St. Louis	4.831c. a lb.
Zinc, New York	5.206c. a lb.
Lead, St. Louis	4.361c. a lb.
Lead, New York	4.511c. a lb.

†Price ¼c. higher in Connecticut Valley.

One of the out-of-the-ordinary uses for Electromode Electric Unit Heaters is their adoption by governments for heating submarines.

The Electric Air Heater Co. Division of the American Foundry Equipment Co., 555 Byrkit Street, Mishawaka, Ind., has just received an order for 33 of its 4-kw. heaters. These heaters will be used in submarines being built by the Electric Boat Co.

Fabricated Structural Steel

NORTH ATLANTIC STATES

Kingston, R. I., 100 tons, library, to Bethlehem Fabricators, Inc.

Grosvenor Dale, Conn., 115 tons, mill extension, to Harmon Steel Co.

Hartford, Conn., 105 tons, St. Joseph's Novitiate, to Topper & Griggs Co.

Albany, N. Y., 300 tons, alterations to mill building for paper company, to James McKinney & Son.

West Park, N. Y., 120 tons, Mother Cabrini School, to B. Schacht & Son.

Brooklyn, 175 tons, residence for Kings County Hospital, to Weatherly Steel Co.

Brooklyn, 3770 tons, Franklin K. Lane High School, to McClintic-Marshall Corp.

New York, 890 tons, public school No. 107 in Bronx, to Harris Structural Steel Co.

New York, 960 tons, Randall's Island Junction, Contract No. 47, to Harris Structural Steel Co.

Lansingburg, N. Y., 310 tons, school building, to McClintic-Marshall Corp.

Buffalo, 2480 tons, court house, to McClintic-Marshall Corp.

Springfield, Long Island, 2300 tons, Andrew Jackson High School, to Harris Structural Steel Co.

Kearny, N. J., 230 tons, factory building, to Savary & Glaeser Co.

Edge Moor, Del., 670 tons, four warehouses for Ludlow Mfg. Co., to Robinson Steel & Iron Co.

Wyoming County, Pa., 210 tons, highway bridge, to Fort Pitt Bridge Works Co.

Centre-Clinton Counties, Pa., 225 tons, State highway bridge, to Fort Pitt Bridge Works Co.

Baltimore, 160 tons, pier No. 1, to Steel Fabricating Co.

SOUTH AND SOUTHWEST

Pickwick Landing, Tenn., 570 tons, wall armor for TVA dam, to American Bridge Co.

Coal Creek, Tenn., 380 tons, spillway bridge for TVA, to McClintic-Marshall Corp.

Clarksburg, W. Va., 200 tons, bridge, to Wisconsin Bridge & Iron Co.

Charleston, W. Va., 1400 tons, Navy Yard structural and pipe shops, to Belmont Iron Works.

Cherokee-Wagoner Counties, Okla., 665 tons, highway bridge, to Virginia Bridge & Iron Co.

Texas County, Okla., 185 tons, highway bridge, to Capital Iron Works Co., Topeka.

CENTRAL STATES

Speed, Ind., 400 tons, Louisville Cement Co. building, to McClintic-Marshall Corp.

Lafayette, Ind., 250 tons, State highway bridge, to McClintic-Marshall Corp.

Cincinnati, 110 tons, building for Eagle Picher Lead Co., to Oregon Bridge Co.

Detroit, 320 tons, buckstays for Koppers Construction Co., to Babcock & Wilcox Co.

Pontiac, Mich., 230 tons, building for Baldwin Rubber Co., to Palmer-Bee Co.

Battle Creek, Mich., 115 tons, State highway bridge, to R. C. Mahon Co.

Baraboo, Wis., 400 tons, overhead crossing, to Worden-Allen Co.

Milwaukee, 150 tons, brewery, to Worden-Allen Co.

Tillford, S. D., 150 tons, State highway bridge, to McClintic-Marshall Corp.

Pike County, Mo., 100 tons, highway bridge, PWA project No. 47, to Vincennes Bridge Co.

Durand, Kan., 160 tons, bridge work for Missouri-Pacific, to Missouri Valley Bridge & Iron Co.

St. Louis, 100 tons, George Warren Brown Memorial Hall, Washington University, to LaSalle Iron Works, St. Louis.

Camden County, Mo., 2025 tons, bridge, to Stupp Brothers Bridge & Iron Co.

Hartwell, Neb., 140 tons, State highway bridge, to American Bridge Co.

WESTERN STATES

Larimer County, Colo., 170 tons, highway bridge, to Midwest Steel & Iron.

Wiggins, Colo., 280 tons, State highway bridge, to McClintic-Marshall Corp.

Chappell, Mont., 270 tons, State highway bridge, to Virginia Bridge & Iron Co.

Ahsahka, Idaho, 410 tons, State highway bridge, to McClintic-Marshall Corp.

Clearwater County, Idaho, 400 tons, State bridge, to Pacific Coast Steel Corp.

Jefferson County, Wash., 122 tons, State bridge over Big Quillece River, to Pacific Car & Foundry Co.

Bremerton, Wash., 120 tons, garage at Puget Sound Navy Yard, to Pacific Car & Foundry Co.

Camby, Ore., 150 tons, bridge, to Wisconsin Bridge & Iron Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Providence, R. I., 350 tons, Rhode Island School of Design.

New York, 1500 tons, depression of New York Central tracks, West Thirty-fourth to Forty-second Streets; general contract let to George J. Atwell Foundation Corp., New York.

New York, 4300 tons, depression of New York Central tracks, Seventy-sixth to Seventy-ninth Streets; bids to be taken Nov. 22.

Brooklyn, 2000 tons, public school, No. 49.

Queens, N. Y., 900 tons, public school No. 164.

Endicott, N. Y., 200 tons, Erie Railroad grade crossing elimination.

Olean, N. Y., 400 tons, Erie Railroad grade crossing elimination; bids taken by State.

Steuben County, N. Y., 200 tons, grade crossing elimination.

Niagara Falls, N. Y., 400 tons, sewage disposal plant; bids Nov. 15.

Philadelphia, 1000 tons, additions to Northeast high school; bids Nov. 9.

Philadelphia, 150 tons, elementary school; bids Nov. 9.

Scranton, Pa., 800 tons, junior high school.

Washington, 2000 tons, Archives building; removed from active list but recently reinstated for bidding on Nov. 25.

THE SOUTH

Fort McClelland, Ala., 300 tons, building.

State of Texas, 1125 tons, bridges.

CENTRAL STATES

Hammond, Ind., 3000 tons, overhead crossing.

The Products

The Plant

The Question

The Name

The Location



Do you use such products and do you appreciate quality, prompt deliveries, attention, and perfect packaging?

If so, write

CLARK BROS BOLT CO.

CLARK STREET
MILLDALE, CONNECTICUT

Bridgeport, Ind., 400 tons, bridge.

Cincinnati, 600 tons, University of Cincinnati building.

Cleveland, 400 tons, housing project.

Edwards Station, Ill., 230 tons, State highway bridge.

Stickney, Ill., 450 tons, pump and blow house for Sanitary district of Chicago.

Chicago, 400 tons, sanitary district power house.

Armington, Ill., 250 tons, bridge.

Shipman, Ill., 110 tons, bridge.

State of Illinois, 300 tons, bridges.

Havana, Ill., 1700 tons, bridge.

State of South Dakota, 150 tons, bridges.

Weldon Springs, Mo., 4925 tons, highway bridge over Missouri River; opening of bids postponed from Nov. 8 to Nov. 15.

WESTERN STATES

State of Montana, 750 tons, bridges.

Casper, Wyo., 591 tons, Seminole dam and power plant; bids Nov. 26.

Casper, Wyo., 195 tons, tunnel supports on Casper Canal; bids Nov. 25.

Humboldt County, Nev., 114 tons, State underpass near Winnemucca; bids opened Nov. 3.

Beaumont, Cal., 137 tons, State underpass at Beaumont; bids Nov. 21.

San Jose, Cal., 107 tons, State underpass; bids Nov. 20.

Los Angeles, 100 tons, crane runway for Department of Water and Power; Consolidated Steel Corp. low bidder.

FABRICATED PLATES

AWARDS

Pittsburgh, 400 tons, four dump scows for United States Engineers, to Ingalls Iron Works Co.

Huntington, W. Va., 195 tons, whirler derrick boats for United States Engineers, to Treadwell Construction Co.

Wyandotte, Mich., 140 tons, tanks for Petroleum Refinery, Inc., to Buffalo Tank Corp.

Phoenix, Va., 520 tons, elevated tank for Newport News waterworks, to Chicago Bridge & Iron Works.

NEW PROJECTS

Casper, Wyo., 183 tons, Seminole dam and power plant; bids Nov. 26.

Casper, Wyo., 208 tons, Casper tunnel on Casper-Alcova project; bids Nov. 25.

Fort Peck, Mont., 684 tons, 28-in. land pipe; bids opened Nov. 6.

St. George, Utah, 500 to 700 tons, 10 to 16-in. welded pipe; Consolidated Steel Corp. low bidder.

SHEET PILING

AWARDS

Cairo, Ill., 1200 tons for levee wall, to Carnegie-Illinois Steel Corp.

State of Washington, 395 tons, Grand Coulee bridge, for Bureau of Reclamation, Denver, to Carnegie-Illinois Steel Corp.

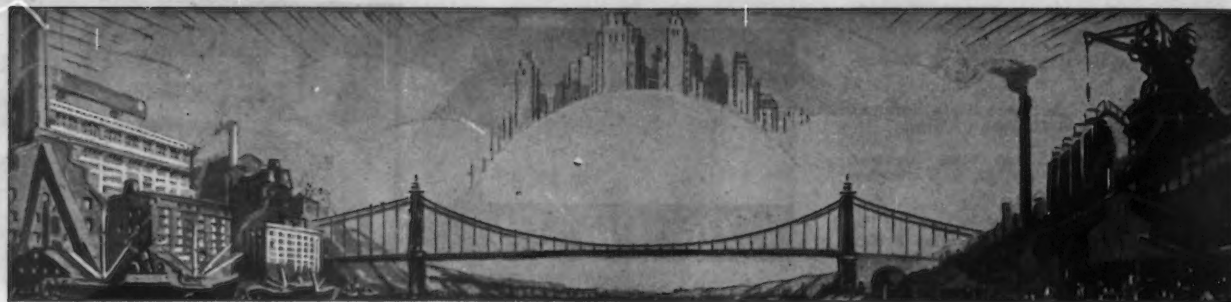
San Diego, Cal., 400 tons, bulkhead for Navy Department at San Clemente, to Columbia Steel Co.

NEW PROJECTS

Onalaska, Wis., 750 tons, lock and dam No. 7; bids Nov. 21.

Large Bar Tonnage In Coast Aqueduct

LOS ANGELES, Nov. 5. — The Metropolitan Water District of Southern California has made the following general contract awards for a 25-mile unit of the Colorado River aqueduct: two schedules involving 8750 tons of bars, to American Concrete & Steel Pipe Corp., with the steel reported placed with Columbia Steel Co.; one schedule, involving 5500 tons of bars, to United Concrete Pipe Corp. Bids on schedules 6C and 7C were rejected and new bids on schedules 6P and 7P, requiring 9000 tons of bars, without cast in place alternates, will be readvertised. All steel is to be furnished by contractors.



Plant Expansion and Equipment Buying

Machine Tool Business Gradually Picking Up—Automotive Companies Enter Market

THE most amazing development of the past week in the machine tool market has been the placing of initial orders for equipment for 1937 cars by certain automobile companies. Deliveries are specified to start in April. In most cases heavy tools requiring a long time for production are involved. Other buying from the Detroit sector is reported and Chevrolet will shortly spend about \$250,000 for presses for its new commercial body plant at Indianapolis. Chrysler is having some special machinery rebuilt and Pontiac and Chevrolet have asked for bids on special tools designed to reduce costs.

General demand for machine tools is still relatively quiet, but some builders report a slightly heavier volume of business in October than they took in the preceding month. November is expected to show further improvement, although a few prospective buyers claim that their appropriations have been exhausted for the present year and that they will have to wait until the first of January before ordering equipment.

◀ NORTH ATLANTIC ▶

Solvay Process Co., 40 Rector Street, New York, plans new works at Hopewell, Va., for production of chlorine and sodium nitrate, and contract for superstructure has been let to Virginia Bridge & Iron Co., Roanoke, Va. Plant is scheduled for completion next spring and will be operated in conjunction with adjoining works of Atmospheric Nitrogen Corp., an affiliated interest. Cost close to \$1,000,000 with equipment. Both companies are subsidiaries of Allied Chemical & Dye Corp., 61 Broadway, New York.

Continental Can Co., 1 Pershing Square, New York, and 3815 South Ashland Avenue, Chicago, has filed plans for three-story addition to plant at last noted place, 198 x 300 ft., for which building contract has been let to Albert S. Low, 510 North Dearborn Street, Chicago. Cost about \$500,000 with equipment. T. B. Jorgensen, 510 North Dearborn Street, is architect.

A. P. W. Paper Co., 1273 Broadway, Albany, N. Y., has let general contract to J. P. Sewell, 372 Hudson Avenue, for addition to mill at West Albany, and improvements in present plant. Cost close to \$500,000 with equipment. Johnson & Wierk, Grand Central Terminal Building, New York, are consulting engineers.

Canada Dry Ginger Ale, Inc., 122 East Forty-second Street, New York, has leased building at Mount Vernon, N. Y., totaling 55,000 sq. ft. floor space, for new branch storage and distributing plant. Building at 246 Raymond Boulevard, Newark, N. J., also has been leased, approximately 15,000 sq. ft. floor space, for similar branch plant.

City Council, Plattsburg, N. Y., will soon take bids for new municipal electric light and power plant, using Diesel engine-generating units; also for electrical distributing lines. Fund of \$520,000 has been se-

cured through Federal aid. Burns & McDonnell Engineering Co., Kansas City, Mo., and 111 North Pearl Street, Albany, N. Y., is consulting engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 12 for about 42,000 lb. steel deck lug forgings for Brooklyn Navy Yard (Schedule 6366); tank level indicating systems (Schedule 6363), insulated electric cable (Schedule 6347), for Brooklyn and Charleston, S. C., yards; six motor-driven engine lathes and spare parts for Brooklyn, Philadelphia and Charleston yards (Schedule 6380); until Nov. 15, 15 electric arc welding sets for Brooklyn and San Pedro yards (Schedule 6370), three oxygen regulators, three ventilating fans and spare parts for Brooklyn and Philadelphia yards (Schedule 6376).

Lehigh Steel Co., 313 West Twentieth Street, New York, has filed plans for new two-story storage and distributing plant, 44 x 107 ft., at 16-18 Bethune Street. Cost about \$30,000 with equipment. Irving M. Fenichel, 724 Fifth Avenue, is architect.

Board of Directors, New York University, Washington Square, New York, plans new three-story engineering building at University Avenue and 180th Street, Bronx, including power plant. New unit will be equipped for hydraulic laboratories, material-testing laboratories and other mechanical service. Cost about \$400,000. Financing has been arranged through RFC.

Signal Supply Officer, Army Base, Brooklyn, asks bids until Nov. 14 for radio transmitting equipment (Circular 68); until Nov. 22 for radio receivers (Circular 65).

Newark Plaster Co., 65 Bridge Street, Newark, has let general contract to Industrial Engineering Co., 50 Church Street, New York, for new plant at Jacobus Avenue and Lincoln Highway, Kearny, N. J.,

comprising two one-story units for factory and for storage and distribution respectively. Cost about \$275,000 with machinery. F. V. Budell is company engineer.

Board of Education, Elizabeth, N. J., has plans for new three-story vocational school, for which bids will be asked soon on general contract. Cost about \$500,000 with equipment. Financing has been arranged through Federal aid. R. C. Edwards, 6 Hillside Road, is architect.

Commanding Officer, Frankford Arsenal, Philadelphia, asks bids until Nov. 11 for 16,560 steel base plug forgings and for 14,600 cast iron fuse hole plugs (Circular 188).

Purchasing and Contracting Officer, Air Corps, Middletown, Pa., asks bids until Nov. 25 for one electric bridge, three cranes, 10 hoists and 20 trolleys (Proposal 5).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 19 for 200 rate-of-climb indicators (Schedule 6417) for Philadelphia Navy Yard; 11,400 lb. brass boat facings (Schedule 6400), for Philadelphia and Norfolk yards and other naval stations.

◀ NEW ENGLAND ▶

Veeder-Root, Inc., Sergeant Street, Hartford, Conn., manufacturer of counting devices and parts, die castings, metal stampings, etc., plans four-story addition, 45 x 160 ft. Cost over \$85,000 with equipment.

Commanding Officer, Springfield Armory, Springfield, Mass., asks bids until Nov. 12 for seamless steel tubing (Circular 51).

Board of Selectmen, Dr. Ernest J. Smith, chairman, building commission, Ipswich, Mass., plans manual training department in new three-story high school, for which bids will be asked soon on general contract. Fund of \$233,000 has been arranged through Federal aid. J. William Beal Sons, 185 Devonshire Street, Boston, are architects.

Milford Rivet Co., Bridgeport Turnpike, Milford, Conn., has let general contract to John L. Simpson, 140 Putnam Street, Bridgeport, Conn., for one-story addition. Cost about \$24,000 with equipment. O. N. Rasmussen, Bridgeport, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 12 for motors and brakes, control appliances and spare parts for Portsmouth, N. H., and Mare Island Navy Yard (Schedule 6313); until Nov. 15, one motor-driven armature turning lathe for Portsmouth yard (Schedule 6416).

United American Bosch Corp., Main Street, Springfield, Mass., manufacturer of carburetors, parts and kindred equipment, has superstructure under way for one-story addition, 110 x 240 ft., for which general contract recently was let to E. F. Carlson, Inc., 1694 Main Street. Cost over \$75,000 with equipment.

Casco Products Corp., Railroad Avenue, Bridgeport, Conn., manufacturer of automotive parts and equipment, has let general contract to Walter V. Stapleton, 604 West Taft Avenue, for two-story addition,

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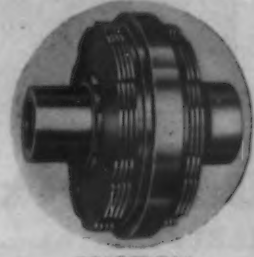
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HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

36 x 77 ft. Cost about \$40,000 with equipment. Fletcher-Thompson, 1336 Fairfield Avenue, is engineer.

◀ OHIO AND INDIANA ▶

Columbus Railway, Light & Power Co., Columbus, Ohio, plans rebuilding power substation and electrical distributing plant, recently destroyed by fire. Loss over \$125,000 with equipment.

Siegfried Loewenthal Co., 101 High Street, Cleveland, has let general contract to Paugh & Brown, 6007 Euclid Avenue, for one-story addition to distilling plant, 90 x 120 ft. Cost close to \$100,000, including equipment and improvements in present building. W. S. Ferguson Co., 3030 Euclid Avenue, is architect and engineer.

Ferbert-Schorndorfer Co., 12815 Elmwood Avenue, Cleveland, manufacturer of paint, varnishes, oils, etc., has let general contract to Sam W. Emerson Co., 1036 Euclid Avenue, for three-story addition, 50 x 55 ft. Cost about \$70,000 with equipment.

Inland Mfg. Co., 15 Coleman Street, Dayton, Ohio, manufacturer of steering wheels and other automotive accessories, a division of General Motors Corp., has plans for two-story addition, 30 x 65 ft., primarily for rubber cement manufacture, including mixing machines, bucket elevator, conveyors and other machinery. Cost about \$30,000.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, asks bids until Nov. 11 for 25 bomb rack nose beam assemblies (Circular 333), 100 gun con-

trol trigger switch assemblies and 400 plunger assemblies (Circular 304); until Nov. 18, 230 engine control assemblies and 40 switch assemblies (Circular 325), 53,900 ft. flexible conduit (Circular 316); until Nov. 21, 110 gun control double lever and bracket assemblies, and 2000 tow target release drags (Circular 332).

Timken Roller Bearing Co., Canton, Ohio, has let general contract to Gibbons-Grable Co., Mellett Building, for four-story and basement addition, 37 x 75 ft. Cost over \$50,000 with equipment.

Indiana State Teachers College, Terre Haute, Ind., G. C. Cole, business manager, asks bids until Nov. 12 for extensions and improvements in power plant at local State normal school, including new 360-hp. water-tube boiler and accessories, chain grate stoker, turbine pumping unit and auxiliary equipment. John M. Rotz Engineering Co., Merchants' Bank Building, Indianapolis, is consulting engineer.

Lakeside Welding Co., 3005 East Fifty-fifth Street, Cleveland, has been organized by John G. Lincoln and Homer Meador to conduct commercial weldery. With its own stress relieving equipment, new Lakeside shop, will handle welding work of all kinds, including machine parts and bases, also contract welding in tank building, railroad and bridge fields.

◀ BUFFALO DISTRICT ▶

Will Corp., 845 Maple Street, Rochester, N. Y., manufacturer of chemical and processing plant equipment, parts, etc., has let general contract to Charles Bippes, 265 Spencer Road, for one-story addition, 120 x 130 ft., with extension, 28 x 185 ft. Cost close to \$75,000 with equipment. Gordon & Kaelber, 311 Alexander Street, are architects.

City Manager, City Hall, Niagara Falls, N. Y., asks bids until Nov. 15 for pumping plant for new sewage disposal works; also for machinery for disposal plant, electrical equipment, etc. George L. Watson, 11 West Forty-second Street, New York, is consulting engineer.

Maday Body Works, 1760-62 Genesee Avenue, Buffalo, affiliated with Anthony Hoist & Dump Body Co., same address, manufacturer of hydraulic dump bodies and other automobile bodies, plans rebuilding part of plant recently destroyed by fire. Loss close to \$30,000 with equipment.

Pierce Butler Radiator Corp., Syracuse, N. Y., has been organized to take over Pierce, Butler & Pierce Mfg. Co., Pearl and James Streets, manufacturer of radiators, boilers and other domestic heating equipment. Blair A. McFarlane will be president of new company.

◀ WASHINGTON DIST. ▶

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until Nov. 18 for automobile parts (Proposal 57); 375 governors for motor trucks (Proposal 59); until Nov. 19, automobile parts (Proposal 60); until Nov. 20, tools, oilers, tool bags, towing chains and other supplies (Proposal 51).

Fibre Board Container Co., Williamsburg Avenue, Richmond, Va., has let general contract to James Fox & Sons, 2501 East Franklin Street, for one-story branch plant at Martinsville, Va. Cost close to \$100,000 with machinery.

Division of Purchases and Sales, Department of Commerce, Washington, asks bids until Nov. 11 for hardened and ground tool steel mandrels (Proposal 27654).

General Purchasing Officer, Panama Canal, Washington, asks bids until Nov. 13 for pipe clamps, pipe fittings, pipe hangers, conduit elbows, bolts, screws, metal valves, cocks, insulated cable, magnet wire, ratchet braces, pipe wrenches, vises, hay forks, escutcheon pins, expansion anchors, stove wire and other equipment (Schedule 3103).

Fauquier County School Board, Warrenton, Va., plans manual training department in new two-story high school, for which general contract is being let to John W. Hunt & Co., Inc., Washington. Cost about \$130,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until

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Offices in Principal Cities

Nov. 12 for six motor-driven grinders for Washington yard (Schedule 6399); electric storage batteries (Schedule 6344); electric air heaters and spare parts (Schedule 6338); 300 engine-driven vacuum pumps (Schedule 6377); until Nov. 15, 5000 sq. ft. copper-nickel alloy wire cloth and 5000 sq. ft. corrosion-resisting steel wire cloth (Schedule 6361); steam separators for whistle and siren (Schedule 6354); until Nov. 19, screwdrivers (Schedule 6409), ratchet braces, breast and ratchet drills (Schedule 6412), electric glue pots and about 1000 electric soldering irons (Schedule 6406) for Eastern and Western yards; until Nov. 15, one motor-driven slotting and shaping machine (Schedule 6388); one electric spray-painting outfit (Schedule 6382); one precision lathe (Schedule 6374); one motor-driven radial drill (Schedule 6375) for Keyport naval station.

◀ SOUTH CENTRAL ▶

United States Engineer Office, Mobile, Ala., asks bids until Nov. 20 for crest gates and auxiliaries for dam No. 17, Black Warrior River, including 44 gate hoists, one revolving crane, two operating cars, 88 reaction wheel assemblies, 88 guide wheel assemblies, 87,000 lb. steel castings, 3400 lb. iron castings, etc. (Circular 90).

Cave Springs Distillery Corp., Newport, Ky., recently organized, has engaged Glazier & Morledge, 305 Walnut Street, Cincinnati, engineers, to prepare plans for new plant on 35-acre tract near Newport, lately acquired, comprising one and multi-story buildings, with power house, machine shop and other units. Storage and distributing building will be erected. Cost about \$175,000. Arthur Fischman is vice-president.

City Council, Bessemer, Ala., plans about 50 miles of electric power transmission lines and power substation and switching station, securing power supply from Tennessee Valley Authority system. Fund of \$1,238,000 has been secured through Federal aid.

Buffalo Springs Distillery Co., Stamping Ground, Ky., plans extensions and improvements, including new mechanical bottling plant. Cost over \$50,000 with equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Nov. 19 for control battery charging sets for Norris and Wheeler hydroelectric power plants.

◀ WESTERN PA. DIST. ▶

Erie Brewing Co., Erie, Pa., has let general contract to Kirschner Brothers Contracting Co., Erie, for extensions and improvements, including new unit for storage and distribution. Cost close to \$50,000 with equipment.

New River & Pocahontas Coal Co., Newhall, W. Va., plans rebuilding part of tippie at local mining properties recently destroyed by fire. Loss over \$40,000 with machinery.

Dairymen's Milk Co., 1428 High Street, Pittsburgh, plans power house in connection with new dairy and milk products plant on 4-acre tract, recently acquired on Saw Mill Run Boulevard. Entire project will cost about \$175,000 with conveying, loading and other mechanical-handling equipment. Louis M. Vinocur is president.

North Fayette Township Board of Education, Allegheny County, near Pittsburgh, care of J. H. Phillips, Wabash Building, Pittsburgh, architect, plans manual training department in new two-story high school. Fund of \$117,000 has been secured through Federal aid.

◀ SOUTH ATLANTIC ▶

Southeastern Machinery Co., Atlanta, Ga., George F. Andrews, 693 Humphries Street, N. W., president, plans new one-story factory for manufacture of mechanical equipment and parts. Cost close to \$25,000 with machinery.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for hangar units with shop facilities at Naval Air Station, Pensacola, Fla. (Specification 8082).

Spartanburg Coca Cola Co., Liberty and Trimmer Streets, Spartanburg, S. C., plans new two-story mechanical bottling works in Park Hills district; also an automobile service, repair and garage building for company motor trucks and cars. Cost about \$70,000 with equipment. J. Frank Collins, Andrews Building, is architect. W. G. Jackson is general manager.

Radiator Specialty Co., Charlotte, N. C., plans early rebuilding of part of plant recently destroyed by fire. Loss close to \$45,000 with equipment. George I. Ray is president.

Town Council, Silver City, N. C., asks bids until Nov. 15 for three motor-driven centrifugal pumps and accessories, steel wash water tank and steel clear water tank, filter plant machinery, pipe lines, etc., for municipal waterworks. A. C. Linberg, Burlington, N. C., is consulting engineer.

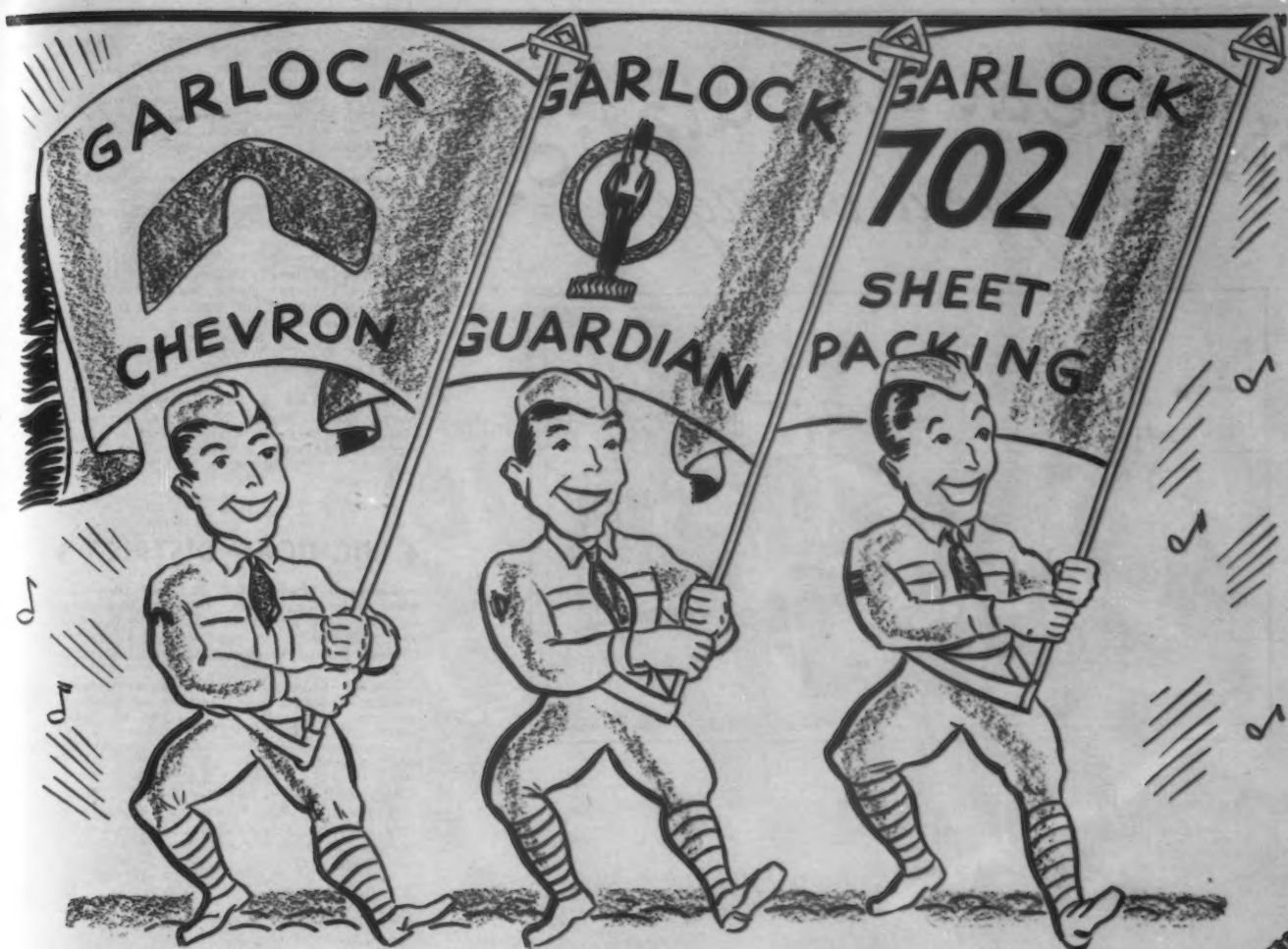
◀ MIDDLE WEST ▶

Belden Mfg. Co., 4647 West Van Buren Street, Chicago, manufacturer of insulated wire products, has asked bids on general contract for one-story addition. Cost close to \$30,000 with equipment. Edwin H. Clark, 8 East Huron Street, is architect.

American Distillery Co., Peoria, Ill., has approved plans for multi-story for storage and distribution. Cost over \$150,000 with equipment.

Board of Education, Marseilles, Ill., plans manual training department in new three-story high school. Fund of \$150,000 has been arranged through bond issue and Federal aid. Childs & Smith, 430 North Michigan Avenue, Chicago, are architects.

Iowa Public Service Co., Fort Dodge, Iowa, plans new steam-operated electric



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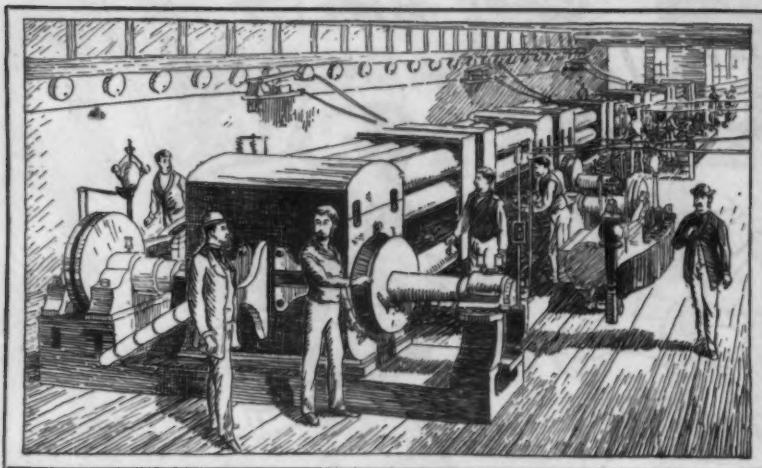
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power plant at Hampton, Iowa, with extensions in transmission lines in that district. Cost about \$100,000 with equipment.

United States Indian Service, Fratt Building, Billings, Mont., asks bids until Nov. 12 for cast iron manhole frames and covers for Crow Creek, S. D.; similar manhole frames and covers for Pine Ridge, S. D.; 210 36-in. diameter half-circle corrugated galvanized steel culverts, open bottom, for Browning, Mont.; two 150-hp. horizontal return tubular boilers for Cheyenne River Agency; two similar 150-hp. boiler units for Flandreau Agency, S. D.

Board of Public Works, Alexandria, Minn., asks bids until Nov. 12 for 150,000-gal. elevated water storage tank for municipal water system. Burlingame & Hitchcock, Sexton Building, Minneapolis, Minn., are consulting engineers.

City Council, Iowa City, Iowa, will soon take bids for new municipal electric light and power plant and distributing system. Fund of \$915,000 has been arranged through Federal aid. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

United States Engineer Office, Clock Tower Building, Rock Island, Ill., asks bids until Nov. 26 for power, control and lighting system for lock and dam No. 11, Mississippi River, near Dubuque, Iowa, including central and remote control stations, dam power distribution system, conduit system, dam lighting and navigation signal and lighting systems, gas-electric emergency standby power unit, hand-operated traveling bridge crane, electric-operated tow-haulage units, power feeder lines and complete auxiliary equipment.

Electrical Equipment Mfg. Co., Beloit, Wis., manufacturer of welding equipment, battery chargers, and electrical maintenance specialties, has acquired local site for new plant, 150 x 200 ft., one-story sawtooth construction, to cost about \$50,000 with equipment. Contract for 100-hp. Diesel generator unit has been placed with Fairbanks, Morse & Co., Beloit.

Board of Vocational Education, Oshkosh, Wis., plans to install cold metal shop in present building, requiring equipment to cost from \$5,000 to \$7,500. A. Milton Bleyer is director.

Roland Miller, Chilton, Wis., clerk of Calumet County, closes bids Nov. 12 for workshop, garage and warehouse for County highway department, 70 x 200 ft., part two stories and basement, to cost about \$64,200. W. C. Weeks, Inc., Sheboygan, Wis., is architect.

Advance Tool & Die Casting Co., 3760 North Holton Street, Milwaukee, is taking bids through H. J. Rotter, local architect, for machine shop addition, ell-shaped, 35 x 120 and 30 x 50 ft., to cost \$20,000 with equipment.

◀ MICHIGAN DISTRICT ▶

American Twist Drill & Tool Co., 2804 West Jefferson Street, Detroit, has plans for one-story addition, 120 x 160 ft. Cost over \$50,000 with equipment. Clair W. Ditchy, Fisher Building, is architect.

Ditzler Color Co., 800 West Chicago Avenue, Detroit, manufacturer of enamels, lacquers, oils, etc., an interest of Pittsburgh Plate Glass Co., Pittsburgh, will build one-story addition. Cost over \$65,000 with equipment.

Wayne Products & Brewing Co., 3603 East Hancock Street, Detroit, plans one-story addition, primarily for a mechanical-canning division. Cost close to \$40,000 with machinery.

Corduroy Rubber Co., Grand Rapids, Mich., manufacturer of automobile tires, mechanical rubber goods, etc., has asked bids on general contract for one and two-story addition, 60 x 100 ft. Cost about \$50,000 with equipment. Nicholas Westra & Son, Grand Rapids, are architects.

Consumers Power Co., Jackson, Mich., plans extensions in transmission and distributing lines in lower peninsula district, with power substation and facilities for rural electrification. Cost over \$100,000 with equipment.

Trenton Valley Distillery Co., Trenton, Mich., has plans for one-story addition for production of grain spirits, dry ice and allied specialties used in main distillery. Cost over \$60,000 with equipment. George F. Diehl, 120 Madison Street, Detroit, is architect.

◀ SOUTHWEST ▶

Atlas Brewing Co., 1908 Walnut Street, Kansas City, Mo., has plans for one-story addition, for storage and distribution. Cost about \$35,000 with equipment.

West Helena Water Works Co., West Helena, Ark., plans extensions in water system, including new pumping machinery and auxiliary equipment.

Board of Education, Chanute, Kan., will soon take bids on general contract for new two-story and basement trade school. Cost about \$125,000 with equipment. Bond issue has been authorized and financing is being carried out through Federal aid. D. B. Peterson, 721 Minnesota Avenue, Kansas City, Mo., is architect.

State Building Commission, State Capitol Building, Jefferson City, Mo., has authorized new power plant for institution at Marshall, Mo., including facilities for central heating. Cost over \$70,000 with equipment. Charles A. Haskins, Finance Building, Kansas City, Mo., is consulting engineer. A similar power plant will be built at institution at Nevada, Mo., to cost close to like amount; same engineer in charge. L. R. Bowen, 315 North Seventh Street, St. Louis, is State supervising engineer; Black & Veatch, 4706 Broadway, Kansas City,

PARKER PROCESSES *in the Electrical Industry*

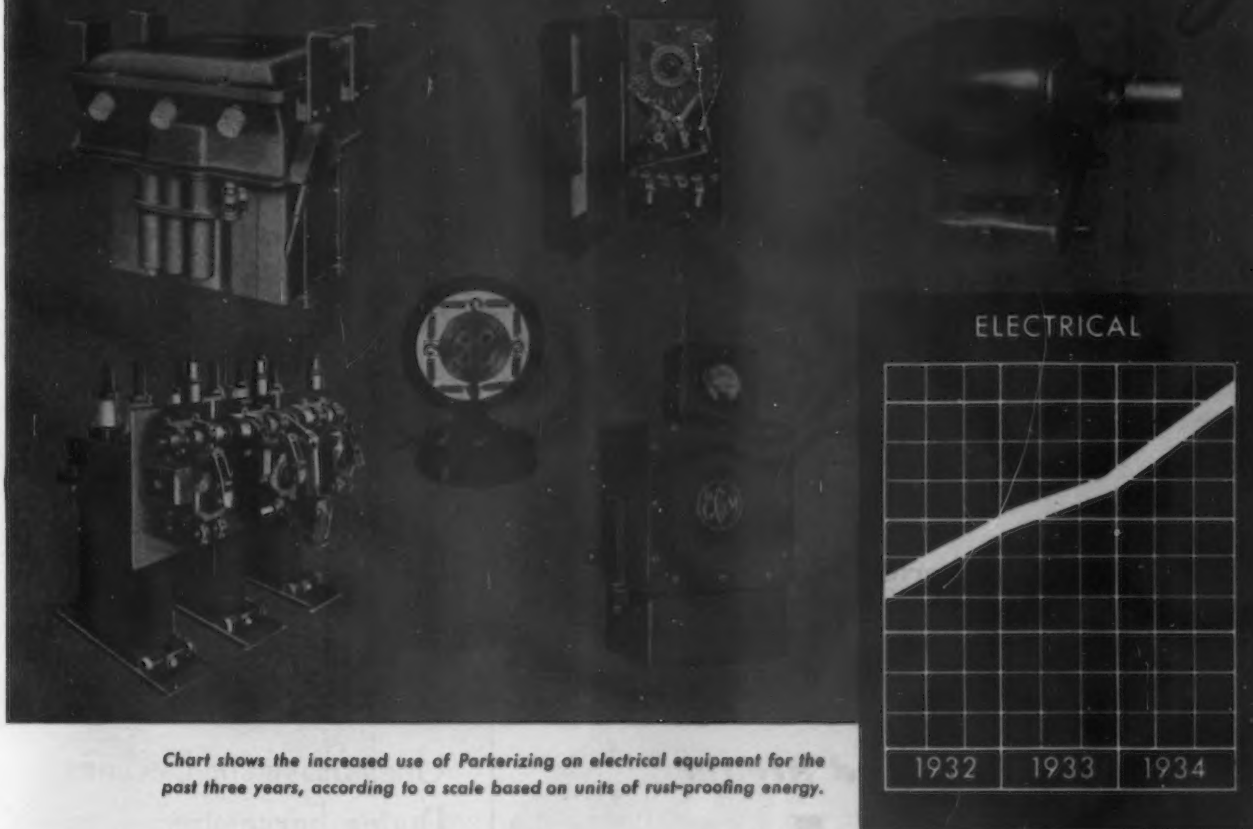


Chart shows the increased use of Parkerizing on electrical equipment for the past three years, according to a scale based on units of rust-proofing energy.

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Mo., are consulting engineers for last noted.

Coca Cola Bottling Co., Brenham, Tex., plans new two-story mechanical bottling plant. Cost about \$35,000 with equipment. Lester R. Woodall is general manager.

Earle M. Jorgensen Co., 10510 South Alameda Street, Los Angeles, structural steel and iron products, will build one-story branch fabricating, storage and distributing plant at Houston, Tex., for which general contract is being let to W. A. Burnet Co., Houston. Cost about \$40,000 with equipment.

◀ PACIFIC COAST ▶

General Motors Corp., Detroit, plans new assembling plant at Los Angeles,

where property has been selected, comprising one story units for parts and assembling of Buick, Pontiac and Oldsmobile automobiles, each designed as individual plant, operated in one area collectively. Cost over \$2,000,000 with equipment. Plant is scheduled for completion early next spring.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 12 for two motor-driven universal cutter grinders (Schedule 6356), two oil and water separator units and spare parts (Schedule 6319); until Nov. 15, two motor-driven pipe and nipple threading machines (Schedule 6365); until Nov. 19, 26,000 ft. electric cable (Schedule 6414) for Mare Island Navy Yard; 26 universal boring heads (Schedule 6431) for Puget Sound yard; until Nov. 15, propeller blades, propeller assemblies, propeller hubs, etc.

(Schedule 900-8912) for San Diego yard; until Nov. 22, ammeters, voltmeters and milliammeters (Schedule 6398) for Mare Island yard; 16 sets relief tube assemblies for aircraft service (Schedule 900-8938) for San Diego yard.

Pacific Cast Iron Fitting Co., 2605 East Twenty-sixth Street, Vernon, Los Angeles, is considering new one-story foundry and plant, 100 x 250 ft., in South Gate district. Cost over \$75,000 with equipment.

Silver Springs Brewing Co., Bay Street, Port Orchard, Wash., plans one-story addition, 30 x 62 ft., for mechanical-bottling department. Cost about \$25,000 with machinery. Headquarters are in Dexter-Horton Building, Seattle. Henry A. Kyer is president.

Betts Spring Co., 388 Folsom Street, San Francisco, manufacturer of steel springs, etc., has awarded general contract to Peter Saratorio, 681 Market Street, for one-story shop addition. Cost about \$25,000 with equipment. Norman B. Green, 55 New Montgomery Street, is consulting engineer.

◀ FOREIGN ▶

Beck, Koller & Co., Ltd., Liverpool, England, manufacturer of synthetic resin and kindred products, has acquired 2-acre tract in Speke district for new plant. Cost close to \$100,000 with equipment.

Compagnie Industrielle et Commercial de Bouchain, Bouchain, France, recently organized, has purchased property in industrial district of city for new plant for production of sulphuric acid, sodium sulphate, hydrochloric acid and kindred heavy chemical specialties. Cost over \$150,000 with machinery.

Municipal Council, Sydney, Australia, asks bids until Nov. 18 for metalclad switchgear for power station at Bunnerong (Specification 1655); until Jan. 6, metalclad switchgear for power station at Camperdown (Specification 1660).

Quebec Central Light & Power Co., Ltd., 477 Francois Xavier Street, Montreal, plans new steam-operated electric power house at St. Hyacinthe, Que., including extensions in transmission lines in that district. Cost over \$150,000. C. B. Hibbard is company engineer.

Unemployment Declines During September

THE total number of unemployed workers in September, 1935, was 9,466,000, according to the regular monthly estimate of the National Industrial Conference Board, made public today. This is a decrease of 386,000, or 3.9 per cent from the preceding month, and a decrease of 927,000, or 8.9 per cent below September, 1934.

From August to September, 1935, the decreases in unemployment, by industrial groups, were: manufacturing and mechanical industries, 182,000; trade, 172,000; mining, 28,000; transportation, 11,000; domestic and personal service, 9,000; and miscellaneous industries, 12,000.

Compared with September, 1934, unemployment in September, 1935, decreased 26.1 per cent in manufacturing and mechanical industries; 7.3 per cent in domestic and personal service; 4.0 per cent in transportation; and 7.0 per cent in miscellaneous industries. Unemployment increased 2.4 per cent in mining.



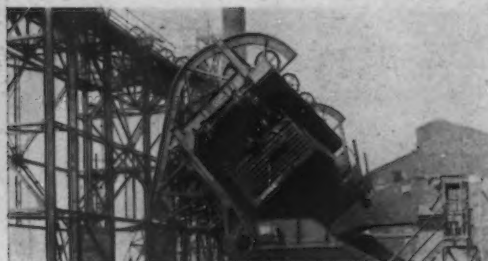
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Extensive Program Planned for A.S.M.E. Annual Meeting

MORE than 90 papers will be presented at the 36 sessions of the annual meeting of the American Society of Mechanical Engineers, to be held at the Engineering Societies Building, New York, Dec. 2-6. Papers planned for some of these sessions are listed below.

IRON AND STEEL

Dec. 3, p.m. (Creep of Metals session, with Applied Mechanics division)—Design Aspect of Creep, by R. W. Bailey; A Method of Analyzing Creep Data, by R. G. Sturm, C. Dumont and F. M. Howell; Creep of Metals, by A. Nadai and E. A. Davis; and Residual Stresses in Cold Drawn Brass Tubes, by O. G. Anderson. A paper by L. L. Wyman at the Power Session, Dec. 4, p.m., will be on Creep Strength of Steels as Influenced by Microstructure.

Dec. 4, a.m.—Bearing Investigation by the Varying Wear Method, by J. R. Connolly and C. C. Hertel; Discussion of Pressure Indicating and Control Equipment for Rolling Mills, led by F. Buckingham, O. S. Peters and S. B. Terry; and Control of Bearing Pressures in Rolling Mills, by O. S. Peters and F. Buckingham.

RADIANT HEAT

Dec. 5, a.m.—Heat Transfer in Steel Reheating Furnaces, by J. E. Eberhardt and Prof. H. C. Hottel; and Tests of Radiation from Luminous Flames, by W. Trinks and J. D. Keller.

Dec. 5, p.m.—Emissivities of Refractory Materials, by R. H. Heilmann; Radiometric and Pyrometric Study of Diffusion Flames, by M. A. Cooper and Prof. H. C. Hottel; Radiation from Pre-Mixing Burner Flames in Combustion Chambers, by E. O. Matlocks; and A Study of Methods for Measuring Flame Temperature in an Internal Combustion Engine, by A. E. Hersey.

APPLIED MECHANICS

Dec. 5, a.m.—Fatigue of Cold Rolled Specimens, by O. J. Horger and J. L. Maubetsch; Rate of Development of

Fatigue Cracks in Steel, by A. F. deForest; Mechanical Properties of Bakelite and its Behavior at Failure, by M. M. Frocht; and Marblette as a New Photoelastic Material, by A. G. Solakian.

Dec. 5, p.m.—Analysis of Plate Examples by Different Methods and the Superposition Principle, by Prof. D. L. Holl; and Buckling and Ultimate Strength of Compressed Rectangular Plates, by Prof. S. Timoshenko.

MACHINE SHOP

Dec. 3, a.m.—Desired Characteristics of Surface Finishes, by J. E. Kline; and Steel Plate Structures vs. Cast Iron, by R. T. Hazelton.

METAL CUTTING

Dec. 4, a.m.—A Study of the Turning of Steel Employing a New Type Three-Component Dynamometer, by Prof. O. W. Boston and C. E. Kraus; and Torque and Thrust of Small Drills Operating in Various Metals, by Prof. O. W. Boston and W. W. Gilbert.

MECHANICAL SPRINGS

Dec. 3, a.m.—Maximum Shearing Stresses in Eccentrically Loaded Helical Springs of Circular Wire, by Prof. H. C. Perkins; Correlation of Spring Wire Bending and Torsion Fatigue Tests, by E. E. Weibel; and Report of Fatigue Tests on Helical Springs.

COSTS

Dec. 5, a.m.—Fundamentals of Cost Accounting, by Charles Reittel; and Industrial Production Costs, by E. S. LaRose.

Dec. 5, p.m.—Industrial Production Costs, by C. H. Knapp; and Power Distribution Costs, by Morris L. Cooke.

PSYCHOLOGY

Symposium on Effect on Human Relations of Technological Changes

Dec. 3, a.m. and p.m.—The Place of Skill in Industry, by Dr. Lillian M. Gilbreth; Human Problems as Created by the Introduction of Labor Saving Machinery, by Prof. Elizabeth F. Baker; Effect on Employees of Technological Changes, by Prof. M. S. Vinales; Development of Physiological Efficiency and the Maintenance of Health when Introducing a Technological Change, by Dr. H. W. Haggard;

and Methods of Introducing Technological Changes, by C. S. Ching.

OCCUPATIONAL DISEASE

Dec. 4, a.m.—The Additional Responsibility Placed Upon Industry by Recent Occupational Disease Legislation, by H. D. Sayer; Engineering Control of Occupational Disease Hazards, by Warren Cook; and Limitations of Protective Devices and Equipment, by Prof. Philip Drinker.

COMPENSATION LAWS

Dec. 4, p.m.—Present Status of Workers' Compensation Laws, by F. R. Jones, F. S. Kellogg and A. J. Lilly.

In addition, three sessions will be devoted to power topics, two to fuels, one to boiler furnaces, one to boiler feed water, two to hydraulics and one to oil and gas power. Three sessions have been arranged by the society's railroad division, and one each by the aeronautic, petroleum, wood industries and textile divisions.

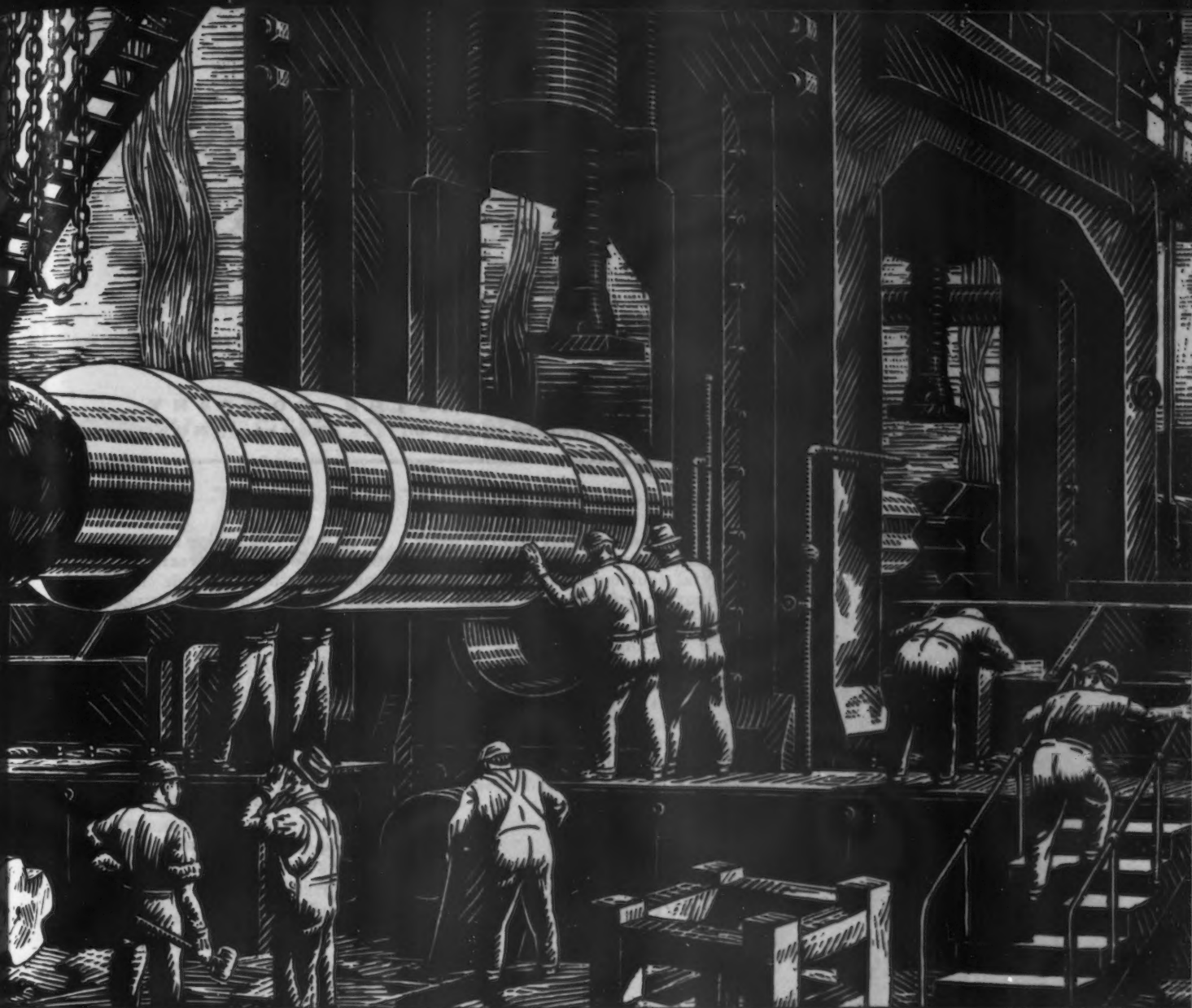
Republic To Issue Sound Picture

THE Republic Steel Corp. will make early release of the first sound picture on the manufacture, fabrication and application of stainless steel. The picture, "Enduro, Republic's Perfected Stainless Steel," has been acclaimed by technical critics at previews to be one of the finest examples of industrial motion picture photography ever produced.

The picture makes use of off-screen narration to describe in chatty, non-technical language the scenes which tell the story of the making of stainless steel and its fabrication into the most intricate forms, as well as those scenes which picture many of the applications which have given it the name, "The Metal of Ten Thousand Uses." Beginning with the mining of its principal component parts, such as chromium in Rhodesia and nickel in Canada, the film traces the various steps in the manufacture of stainless steel. Particularly spectacular are several of the shots showing the handling and pouring of hot metal from the giant electric furnaces in which the steel is made.

The film reveals the many variations from ordinary steel-making practice which are necessary in the making of stainless, and demonstrates the extreme care with which the metal is handled from beginning to end in its production. From the electric furnace to ingot moulds, from soaking pits to blooming and bar mills, from sheet and strip mills to polishing and grinding operations, the film carries the spectator through production process step by step in chronological order.

After the production story has been told, the film depicts the more



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important phases of fabrication, demonstrating the ease with which stainless steel can be welded, soldered, spun, drawn, stamped and formed in ordinary sheet metal brakes. Following are a large number of flashes of installations and applications of stainless steel in widely varying fields. From the Empire State and Chrysler buildings to dainty wrist watches and jewel mountings, the picture runs the gamut of stainless steel uses, touching upon architectural, au-

tomotive, oil refining, dairy, food handling equipment, surgical and dental equipment, chemical manufacturing and domestic fields.

The film was produced by Loucks and Norling, New York, under the direction of Republic's advertising and sales promotion department. It consists of four standard reels and will be ready shortly for distribution. Production scenes in the film were taken at the Republic plants in Canton and Massillon, Ohio.

given more continuous employment than those under 30 years of age; and (5) these records likewise showed that annual earnings increased steadily by age groups, with the maximum being attained between the ages of 55 and 60. Average annual earnings of the man of 50, 55 or older were more than 60 per cent higher than the average for employees under 30.

The study points out that the laborers and operatives included in the survey were the least skilled in automotive factories, stating that "it has been established that the highly skilled employees are less handicapped by age than less skilled groups. This holds for all branches of industry.

Older Workers Are Favored By Automobile Industry

IN most industries great expansion has resulted in reducing the proportion of older workers, while stationary or declining employment has brought a systematic rise in the proportion of older employees, according to a study made by the statistical staff of the Automobile Manufacturers Association. The study was based on United States Census figures and other authoritative sources.

A few industries including automobile manufacturing, moved against this normal trend. Between 1920 and 1930 car makers expanded employment of unskilled and semi-skilled men 39 per cent, at the same time experiencing an increase of 51.3 per cent in the number of these employees 45 years old or older. During the depression years older men have been given preference in continuity of employment and in volume of wages.

Commenting on the study, Alvan Macauley, president of the association, states that "these findings support our belief that the effect of mass production methods and the

intensive mechanization which is necessary in order to obtain a better product at lower prices, does not displace older workers, but rather places an added value upon their experience. Machines worth thousands of dollars, even though almost automatic, cannot be placed in charge of men with no knowledge of automobile work, and efficiency in all operations can only come with practice."

Developments since 1930 in automobile plants shown by the study are: (1) a rapidly expanding company doubled the number of men over 40 employed, but their proportion to the total employed declined slightly; (2) five companies, the combined employment of which remained unchanged, showed a gain of almost 20 per cent in the number of employees over 40; (3) one company which reduced its employment over 40 per cent cut down its number of workers 40 and over only 30 per cent; (4) a study of individual records of more than 75,000 men employed in 14 automobile plants during 1933-1934 revealed that older employees were

Machinists tools; milling cutters and hobs; arbors, collets and adapters; screw machine tools; and miscellaneous equipment made by the Brown & Sharpe Mfg. Co., Providence, R. I., are described and illustrated in a new 448-page, 4½ x 6¾-in., Small Tools catalog designated by the company as the No. 32. Miscellaneous equipment includes ground flat stock, vises, mandrels and expansion bushings, index plates, bench centers, and cutter testing fixtures. The company's gear service is described, and several pages are devoted to useful data.

A new heat resistant material, known as blister-proof micarta, has been developed by the Westinghouse Electric & Mfg. Co. This material, which is said to be suitable for application on bar, counter and table tops, or any other surface likely to come in contact with lighted cigarettes and cigars, is made by molding a thin metal sheet directly beneath the surface of the micarta plate. This sheet acts as a rapid conductor of heat, preventing high temperatures in local spots which otherwise might cause blistering of the material.



For 25 years, the Exide-Ironclad Battery has steadily increased in

VALUE

IN 1910, the Exide-Ironclad Battery was made available to users of electric industrial trucks and tractors, greatly reducing materials handling costs. In the unique construction of Exide-Ironclad positive plates, slotted rubber tubes retain the active material while exposing it freely to the electrolyte.

So great are the advantages of this construction under actual service conditions that the Exide-Ironclad won rapid success, and today holds an outstanding position in the industry.

Year by year, the Exide-Ironclad Battery has benefited by consistent refinement. For example, a new material known as Giant Compound was developed for jars and covers, making them practically unbreakable in normal service. Increased sediment space was provided, making it unnecessary to tear down the battery for cleaning, throughout its life. Other important improvements followed, each contributing to the dependability, long life and economy of the Exide-Ironclad Battery.

Exide Mipor Separators are a recent and revolutionary development. Being immune to electrolyte, heat and vibration, Exide Mipor is assurance of further economies to Exide-Ironclad users.

These continual improvements in the construction of the Exide-Ironclad Battery during the last 25 years have steadily increased the value of this battery. It is today an outstanding buy from every standpoint—cost, service, dependability and economy. Write for free booklet, "The Adaptability of Electric Industrial Trucks and Tractors."

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
 Exide Batteries of Canada, Limited, Toronto



Exide IRONCLAD BATTERIES

WITH EXIDE MIPOR SEPARATORS

"MIPOR," Reg. U. S. Pat. Off.





Dependable WOOLFORD PICKLING TANKS

Before shipment from our Darby, Pa., factory, may we quote on your requirements?

G. WOOLFORD WOOD TANK MFG. CO.

Paschall P. O. Philadelphia, Pa.

The Motohome— a Prefabricated Steel Frame House

(CONTINUED FROM PAGE 37)

In the past four months more than 500,000 people have visited these homes.

Distributing warehouses for prefabricated parts have been established at White Plains, Long Island City, N. Y., and Elizabeth, N. J. Contracts for some forty homes have been closed and many others are under negotiation. Operations of American Houses, Inc., are limited for the time being to a radius of about 100 miles from warehouses, but other depots are contemplated for other sections.

Prices, which do not include lot, excavation, grading or the running of sewer, gas and water lines from road to house, now range from \$4,950 for the smallest house—four rooms and bath—to \$11,800 for a seven-room house, with three baths and two-car garage. The Motohome is being offered as a

quality product; it is not represented as being cheaper than other houses of equivalent size.

While the Motohome will not top the great mass market represented by the lower income strata of our population, it will nevertheless compete in a large field, since it is estimated that construction of houses in its price range, for the country at large, normally amounts to about \$200,000,000 annually.

American Houses, Inc., is affiliated with Houses, Inc., which was recently subsidized by the General Electric Co. to function as a research laboratory in which new ideas in home building will be tested and cleared and also to culture, assist in the management of, or help finance any worthy project designed to produce homes that will be within easy financial reach of those with low incomes.

Bakelite To Show New Equipment

TO demonstrate modern plastic molding equipment and technique, the Bakelite Corp. will feature a newly developed rotary automatic press in operation at the forthcoming Chemical Exposition in New York. Special cast molds made by an exclusive process which has recently been developed by The Gorham Co., silversmiths, have been produced from beryllium copper.

The new, automatic rotary press

has been designed and patented by John Lauterbach Co., Philadelphia. This is a self-contained unit having 20 cavities. It is equipped with a hopper for molding material. A special mechanical measuring device on the hopper measures and delivers predetermined quantities of molding material to each cavity. As the machine rotates, each cavity is filled automatically, and by the time a complete cycle has been made—about 45 seconds—the molded pieces are automatically rejected from the mold cavities.

The press is to be demonstrated in connection with a newly devel-

oped rotary pump, made by the Northern Pump Co., and a Worthington Pump & Machinery air-compressing unit for blowing out flash and ejecting the molded pieces.

Milne To Sell Stainless Bars

AS recently announced in THE IRON AGE, A. Milne & Co., 141 Milk Street, Boston, have been appointed sales agents in New England for alloy steels produced by the Carnegie-Illinois Steel Corp., subsidiary of the United States Steel Corp.

In addition, they will also handle in eastern and northern New England the stainless steel bars and billets of the Carnegie-Illinois Steel Corp.

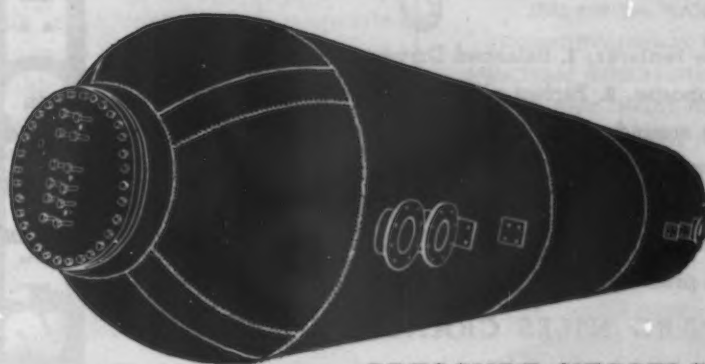
Ludlum Steel Co. has declared a regular quarterly dividend of \$1.62½ per share on its preferred stock for the period ending Dec. 31, 1935, payable Jan. 1, 1936, to holders of record Dec. 20. In the third quarter, the company's net profit before Federal income tax of \$118,199 contrasted with \$7,570 for the same period in 1934. Before Federal income tax, net profits for the first nine months of 1935 totalled \$518,820. The Federal tax will reduce this figure by approximately \$71,337.

The Cherry Valley blast furnace, Leetonia, Ohio, formerly owned by the United Iron & Steel Co., and later owned and operated by the Hanna Furnace Co. and which has been idle for a number of years, will be dismantled by the Kulka Iron & Metal Co., Alliance, Ohio. The furnace was sold at a sheriff's sale for \$14,700.

CHROMIUM *the key Metal*



TO



PRESSURE VESSELS

for RESISTANCE to CORROSION

■ Chromium has made possible the entire series of stainless steels. It is the only alloying element which produces in iron alloys a condition approaching complete resistance to atmospheric corrosion. These stainless chromium-containing alloys also resist the corrosive action of a great many chemical acids and salts. Additionally they possess outstanding creep strength and oxidation resistance at elevated temperatures. They are a satisfactory answer to many of your problems of severe heat and corrosion.

The most efficient vehicle for adding chromium in making stainless steels is

Low-Carbon Ferrochrome, manufactured by Electromet.

Electromet Engineers will be glad to explain how you can use stainless steels to best advantage.

ELECTRO METALLURGICAL COMPANY

Unit of Union Carbide and Carbon Corporation

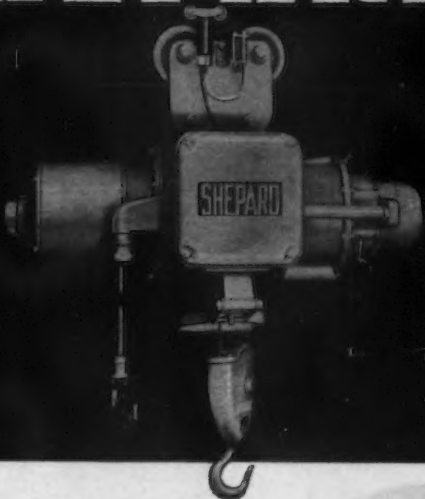
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Electromet
Ferro-Alloys & Metals

SHEPARD



ELECTRIC HOISTS

Exclusive features: 1. Balanced Drive, at two points diametrically opposite. 2. Perfect alignment, maintained by all parts rotating around a common axis. 3. Automatic Oil Bath Lubrication. 4. Control by rope, push button, outrig or controller for every hoist. 5. Precision variable speed control for both A.C. and D.C. 6. Variety of speeds, types, lifts and capacities precisely suited to any service. *Write for complete data.*

SHEPARD NILES CRANE & HOIST CORP.
356 Schuyler Avenue, Montour Falls, N. Y.

Resistance Welding Extensively Employed in Automotive Industry

(CONTINUED FROM PAGE 24)

In electrical upsetting, the die or electrode material must not conduct heat too readily, otherwise the end of the material being upset will be chilled too rapidly and not upset uniformly. The material must be extremely hard to withstand mechanical wear, and at the same time be able to withstand the elec-

trical erosion caused by the slight amount of arcing and concentrated heat produced by the uneven surface of the material to be upset at the beginning of the heating operation. A die or electrode material which fulfills these specifications is made from tungsten, molybdenum and copper and is classified as one

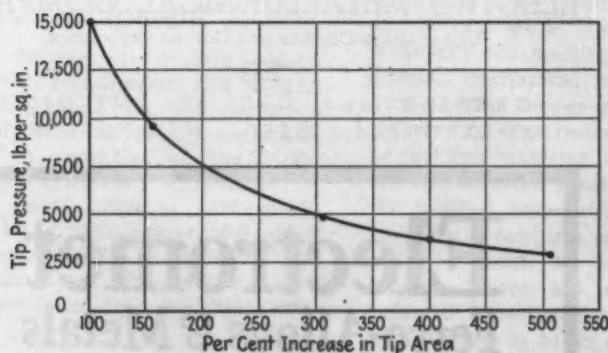


CHART showing relation between electrode area and pressure. Note how pressure per square inch greatly decreases as the tip mushrooms and increases in size.

of the special grades of Elkonite.

There is much room for further improvement of resistance welding in the automotive industry. Machines will be made more automatic and will embody radical departures from those in existence today. Ways and means will be found for doing what we now consider impossible.

The one striking fact which stands out is that in this field increased speed has not been detrimental to the results obtained. In practically all cases where the production rate has improved, better welds have been secured.

Auto Output and Steel Employment Correlated

THE total number of man-hours worked monthly in the steel industry generally increases before the monthly output of passenger automobiles and trucks rises, and decreases when automobile production falls off, according to American Iron and Steel Institute.

Correlation of man-hours worked with automobile production was nearly 80 per cent perfect from September, 1933, through June, 1935.

In July and August of this year, however, man-hours worked by steel employees increased despite a drop in automobile production. The increase is credited to larger orders for steel from a variety of miscellaneous sources.

The relation of the man-hours worked in the steel industry to fluctuations in automobile production varies in different steel producing districts.

The Chicago district, with large sheet, strip and bar capacities, is near automobile plants in Kenosha and Milwaukee and is strategically located with respect to the Detroit area. The number of man-hours worked in Chicago and Gary steel plants responds more promptly and in greater degree to variations in automobile production than do man-hours in other steel centers. Steel plants in the Cleveland, Youngstown Valley and Ohio River districts also respond promptly.

In the Detroit-Toledo and Canton-Massillon districts are made large tonnages of special and alloy steels which require a longer time in preparation than ordinary steels. These districts lead the automobile industry in production by one or two months—today's steel production in those districts is for cars to be built one or two months later.

MAKING STEEL PLATES FOR SPECIAL SERVICES

Bethlehem Mills Produce Many Types and Qualities to Meet Specialized Demands

Making plates to render dependable service under unusual conditions involving excessive corrosion, or wear, or extremes of temperature and pressure is an important phase of Bethlehem's service to modern industry. In making plates that are suited to the requirements of some unusual duty, interesting problems are frequently involved, calling for a degree of skill and experience far beyond that required in making plates for ordinary tasks.

For instance, an application may call for plates which will be low in thermal expansion and more than 3 in. thick, to be exposed to high temperatures and pressures. (It's harder to make thick quality plate than thin.) Another may require a special grade of welding steel, the welds to pass an X-ray inspection. Or the problem may be to obtain a still-bottom steel, for use in an oil refinery, which will withstand an increased number of temperature cycles without cracking from fatigue. Or to develop a plate that is resistant to wear, for service in equipment handling abrasive materials.

To the solution of these and kindred problems Bethlehem brings the results of experience accumulated through years of supplying quality plates to all branches of industry.

Whatever service conditions may be involved, whatever properties, physical or chemical, may be called for, Bethlehem's broad experience, skilled personnel, modern facilities, insure the production of steel plates to fit the purpose.

Bethlehem metallurgists gladly study requirements and cooperate with users in determining the most suitable grade of steel plate to withstand the conditions of the intended service.

MANY TYPES OF PLATES MADE BY BETHLEHEM

To meet the varied needs of industry, Bethlehem makes a wide range of steel plates with special properties. They include the following:

COPPER-BEARING STEEL PLATES
SPECIAL ANALYSIS AND ALLOY-STEEL PLATES
ABRASIVE-RESISTING PLATES
ACID OPEN-HEARTH PLATES
FLANGE PLATES
HOT-PRESSING PLATES
FLANGE AND COLD-FLANGING PLATES
STILL-BOTTOM PLATES
LOCOMOTIVE-FIREBOX PLATES
STRUCTURAL SILICON-STEEL PLATES
HULL AND HIGH-TENSILE HULL PLATES
BOILER AND MARINE PLATES

AMONG FLANGED PRODUCTS MADE BY BETHLEHEM



A few only of the types of flanged products produced by the Bethlehem flange shop. A.S.M.E. and A.P.I.-A.S.M.E. Heads, A.S.M.E. Elliptical Heads, Flanged-only, Standard Flanged-and-Dished Heads, Shallow-Dished and Cover Heads are among Bethlehem Flanged Products. Also Flue Holes; Manholes and Handholes, in parts or fitted complete; Saddles and Covers.



BETHLEHEM STEEL COMPANY

GENERAL OFFICES: BETHLEHEM, PA.

Your Fight is our Fight

when FRICTION is the FOE

Abbott Steel Balls are staunch allies in the fight against friction. Their stamina and precision win satisfied customers for the products in which they are assembled. For "plus" bearing performance in such applications as factory trucks, conveyors, washing machines, lawn mowers, get acquainted with Abbott values. You'll like the quality—you'll like the service.



THE ABBOTT BALL COMPANY

1047 New Britain Ave.,

Hartford, Conn.

Cast Iron and Steel Differentiated

(CONTINUED FROM PAGE 25)

quired shape; cast iron, which is hard and brittle and fusible at a lower temperature; and steel, which partakes of the properties of both."

From part of an abstract in the *Journal of the Iron and Steel Institute*, 1902 (ii) pp. 530-532 of an article by J. O. Arnold in *The Ironmonger*, Vol. 101, pp. 136-141:

"THE DEFINITION OF STEEL—'Is it possible to say what is steel, so as to obtain a sharp, legal definition which will unerringly distinguish genuine steel from its spurious imitations?' Chemical, mechanical, physical or microscopical methods are unfortunately incapable of always distinguishing them. The chemical compositions of steel and of malleable cast iron hopelessly overlapped, and the tensile tests obtained from certain steels and from some varieties of malleable cast iron were so similar that any attempt to distinguish one from the other on mechanical data was out of the question. Physical classification was misleading, since certain varieties of malleable cast iron hardened, tempered, and let down just like steel. Certain malleable iron castings were microscopically identical with certain steels. A legal definition of steel

might, however, be obtained by reference to the process of manufacture, and on this basis he had prepared a classification which sharply defined all the finished materials produced in iron and steel metallurgy. The proposed classification was as follows, and is essentially based on well-established trade terms, which imply that a specific name involves a guarantee that the material to which such name refers was substantially produced by its own specific and recognized method of manufacture:

"STEEL—The word 'steel' on blooms (or billets), slabs, bars, plates, sheets or finished articles shall be deemed a guarantee that the material from which such blooms were made was cast in a fluid condition into an ingot, and that such ingot was afterward forged or rolled, or forged and rolled into blooms (or billets), slabs, bars, plates, sheets, or into other sections suitable for the manufacture of the said finished articles.

"MALLEABLE CAST IRON—Articles molded and cast into shape, and then annealed so as to be made more ductile: (a) by a complete or partial oxidation of their carbon;

or (b) by a change in the condition of their carbon, either alone or accompanied by a partial oxidation of their carbon, shall be defined as 'malleable cast iron' and never as cast steel, steel, or steel castings.

"Exemptions—The definitions of cast steel and steel shall not apply to special alloys of iron which are most suitable for use in their cast state, and which, therefore, do not require forging or rolling, or both, to produce in such alloys the requisite physical properties for the purpose for which they are employed. Such alloys, when cast from a crucible, may be legally marked either cast steel or steel, and when cast from an open-hearth or other furnace, or from a Bessemer or other converter, may be legally marked steel.

"In addition to these definitions and to comments on the outcome of an action arising from the trademarking of certain forms as steel, the author gives a very interesting historical review of this question as affecting Sheffield and shows that it is not the first time that the case has arisen."

From a Report on the Sixth Congress of the International Association for Testing Material, *Journal of the Iron and Steel Institute*, 1912 (ii), p. 374:

"H. M. Howe and A. Sauveur (for Committee 24): ON NOMENCLATURE OF IRON AND STEEL PRODUCTS—The committee was divided in opinion on essential points. The controversies on this subject lay, in the first instance, between British and American views as to the proper definition of such terms as 'iron,' 'steel' and 'malleable cast iron.' As regards 'steel,' it was evident that this term is applied to two different classes of material—viz., the original 'steel' made from cement or blister bar obtained from the cementation of pure wrought iron, and the modern product of the converter or open-hearth process, ranging from materials approximating to nearly pure iron up to those whose carbon content and hardening properties approximate to the older 'steel.' In view of this double meaning it appeared necessary, in the opinion of the American members of the committee, to adopt a separate definition for 'blister steel,' excluding it from the class 'steel' altogether. The British members strongly opposed this

(CONTINUED ON PAGE 106)

YOUR LARGEST POWER COSTS *are in your* MANUFACTURING OPERATIONS



A PRECISION metal working plant, for example, in modernizing a 16 automatic-screw-machine department found that direct motor drive cost \$6,576 to install, whereas Modern Group Drive cost only \$2,688. The saving of \$3,888 in installation alone cut the fixed charge cost of delivering power to the machines \$583 per year. Modern Group Drive was adopted and this real reduction in power costs has become a new net profit.

Between the meter and the machine avoidable items of production cost are frequently found sufficient to spell all the difference between profit and loss in production. Plainly visible power losses are often the

least of these pitfalls. Unless the power transmission system is *exactly* adapted to your production needs, your manufacturing costs are too high.

Do you *know* whether you are applying power to your machines most economically?

3500 Power Transmission Counselors, organized and trained to analyze power wastes and suggest methods of reducing production costs, are at your service, without obligation. Daily, through 60 Power Transmission Clubs in industrial centers, they are cooperating in this work with plant engineers, public utility engineers and consulting engineers. Call them in!

First, however, send for a free copy of the famous Red Book, "A Practical Analysis of Some Fundamental Principles of Industrial Power Transmission." It explains the economic advantages of Modern Group Drive, a product of cooperative industrial research, and gives graphic comparisons with other means of applying power to machines.

POWER TRANSMISSION COUNCIL
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A research association
of producers and distributors
of power, power units and mechanical
equipment for the
transmission of power



A POWER DOLLAR SAVED IS A PROFIT DOLLAR EARNED

The NEW WELDIT Automatic WELDING TORCH with GAS AVER in Handle



**SAVES FUEL...
...CUTS COST**

Thumb controlled Gasaver in handle cuts welding flame to pilot light size instantly when torch is not in actual use. Savings not affected by hose length. No re-lighting, no re-adjusting. Safe and simple to operate.

Send for literature.

WELDIT ACETYLENE CO. 641 BAGLEY AVE. DETROIT, MICH.

TEST THIS WELDING TORCH FREE FOR TWO WEEKS IN YOUR PLANT

AUTOMATICALLY ON IN USE

AUTOMATICALLY OFF NOT IN USE

(CONTINUED FROM PAGE 104)

proposal, and presented an alternative set of definitions. These difficulties, connected with the special Sheffield trade significance of the term 'blister steel,' as well as other points in dispute, were, however, on the point of being satisfactorily overcome, when new difficulties arose. First, Dr. A. S. Cushman raised a strong objection to definitions based upon mode of manufacture and not on chemical composition, his contention centered round the idea that a special American product, 'ingot iron,' although made by an open-hearth process, is in composition and properties so close to the pure element Fe, that it should not be forced into the class of 'steel' by these definitions. As against this it was contended that the trade term 'iron' implies plastic and not fluid origin, and a warm discussion ensued. Subsequently the German delegates also dissented from the report, and in the result the congress felt itself unable to pass any specific resolution on the subject."

From Encyclopedia Britannica, 14th Edition, 1929:

"IRON is principally used when alloyed with other elements, notably carbon; a moderate amount produces steel, an excess produces cast iron."

The article also contains the iron carbon constitutional diagram with a dividing line at 1.7 per cent carbon between steels and cast irons.

Dispute Continues

From "A Comprehensive Treatise on Inorganic and Theoretical Chemistry" by J. W. Mellor, v. 12, 1932, pp. 707-709.

"The Nomenclature of Iron and Steel.

'Socrates: Why should we dispute about names when we have realities of such importance to consider?'

'Glaucón: Why, indeed, when any name will do which expresses the thought of the mind with clearness?'—PLATO.

"There is a difficulty in formulating precise definitions for the chief varieties of iron and steel: (1) wrought iron, (2) steel, (3) cast iron and (4) malleable cast iron. Universally acceptable definitions of commercial iron and steel have not been devised. The various types have been classed in terms of *structure*—eutectiferous and non-eutectiferous; *origin*—whether of molten or plastic origin; *malleability*—whether usefully malleable, like steel, wrought iron and malleable castings, or not usefully malleable, like cast iron;

composition—whether the metal owes its special qualities primarily to carbon or to elements other than carbon. H. M. Howe commenced his discussion with the above quotation from Plato's 'Republic' and the subject has been taken up by many others:

'... Iron containing varying percentages of silicon, phosphorus, etc., along with so much carbon that it is not usefully malleable at any temperature, is called *cast iron*....'

'... Iron which has been cast as brittle white cast iron into molds and afterward made more or less malleable without remelting, is called *malleable cast iron*....'

'... The term *steel* is sometimes applied to iron with less than 2.0 per cent of carbon. The term is also applied to alloys to the left of the point E in the equilibrium diagram, and the term *cast iron* to alloys to the right of that point. C. J. B. Karsten regarded 2.3 per cent as the limit between steel and cast iron. The fashionable definition of steel thus depends on an arbitrarily assigned limit.'"

From the "Report of Sub-Committee XI of Committee A-3 on Cast Iron" (Appendix) of the American Society for Testing Materials Proposed Definitions of Terms Relating to Cast Iron.

("These are proposed definitions and are published as information only. Suggestions for revision are solicited.)

"CAST IRON—Iron containing so much carbon that as-cast it is not usefully malleable at any temperature. Usually from 1.7 per cent to 4.5 per cent carbon is present and in most cases an important percentage of silicon.

"PIG IRON—Cast iron usually produced by smelting iron ores in the blast furnace. It may have been cast into pigs or held in a molten condition for charging into a steel-making furnace.

"GRAY IRON—Cast iron having a gray fracture. It is readily machinable with ordinary tools. The combined carbon usually does not exceed 0.8 per cent.

"WHITE IRON—Cast iron having a white fracture. It is very hard and difficult to machine. The carbon is practically all in the form of iron carbide.

(CONTINUED ON PAGE 110)



18 gauge to $\frac{1}{2}$ inch inclusive up to
72 inches wide depending on gauge

From our new continuous hot mill you can be
assured of a prompt and dependable supply of
strip and sheets, in either cut lengths or coils,
in the gauges and widths listed at the left.

THE YOUNGSTOWN SHEET AND TUBE CO.

Manufacturers of Carbon and Alloy Steels

General Offices - - YOUNGSTOWN, OHIO

BALANCED SPIRAL
(Reg. U. S. Pat. Off.)
CONVEYOR BELT

is
**SMOOTH
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You get maximum belt efficiency by using (U. S. Patent 1,952,873) **BALANCED SPIRAL** because its uniformly flat surface carries your products without tipping or displacing. Other important features are its complete flexibility and ability to hold its original width and not elongate. **Wissco Balanced Spiral Conveyor Belt** therefore gives you better carrying qualities.

WICKWIRE SPENCER STEEL COMPANY
New York City Buffalo Chicago San Francisco

SEND FOR THE NEW CONVEYOR BELT HAND BOOK

(CONTINUED FROM PAGE 106)

"MOTTLED IRON"—Cast iron having a mottled fracture. The structure and fracture show a mixture of gray iron and white iron.

"MALLEABLE CAST IRON"—Iron, white as cast, which has been made malleable by annealing.

"SEMI-STEEL"—A vague trade name for various cast iron products made by adding steel to the melting charge. The term never had a real meaning and should now be considered obsolete.

"HIGH-TEST CAST IRON"—A term formerly used to designate gray cast iron having a minimum tensile strength of 28,000 lb. per sq. in. This term should now be considered obsolete, since A.S.T.M. Specification A-48-32T definitely classifies gray iron castings.

From the above extracts it will be seen that suggested definitions—as summarized above by Mellor—have been terms of structure, origin, malleability and composition. Even though some of the definitions are reasonably satisfactory when applied to unalloyed steels and cast irons, none of them can be satisfactorily used for alloyed steels and cast iron. For instance, a comprehensive definition in terms of malleability is not possible, since, for example, 4 per cent silicon steel for transformer sheets

is brittle and has no appreciable elongation, while certain austenitic cast irons are comparatively ductile, giving several percentages of elongation in tensile.

A definition in terms of origin has to overcome difficulties such as the fact that cast iron rolls are cast from open-hearth furnace melts, or that carbon steels can be cast from cupola melts. A definition in terms of composition, taking 1.7 per cent carbon content as the dividing composition, is satisfactory for unalloyed carbon steels and cast irons and has been extensively adopted. To apply this definition to alloyed steel and cast irons—as is sometimes done—is, however, entirely incorrect for the following reasons. The 1.7 per cent carbon content in the case of unalloyed steels and cast irons represents the maximum solid solubility of carbon in iron and consequently the carbon content which divides iron carbon alloys containing no eutectic from those containing eutectic in the structure. When, however, alloying elements which dissolve in iron are present, they lower the solid solubility of carbon in iron and the figure of 1.7 per cent carbon is progressively lowered as the amount of alloyed element is increased, some elements lowering the solubility much more than others. Exact figures

giving the effects of the various elements on the lowering of the solid solubility cannot be given—as stated in the letter below—but the approximate effects of some of the chief alloying elements are as follows:

Manganese has no appreciable effect on the 1.7 per cent maximum solid solubility of carbon in iron.

Silicon lowers the solubility to less than about 0.1 per cent carbon for silicon content of about 8 per cent and upward.

Nickel lowers the solubility to about 1.4 per cent carbon with 10 per cent nickel and to about 1.2 per cent carbon with 20 per cent nickel.

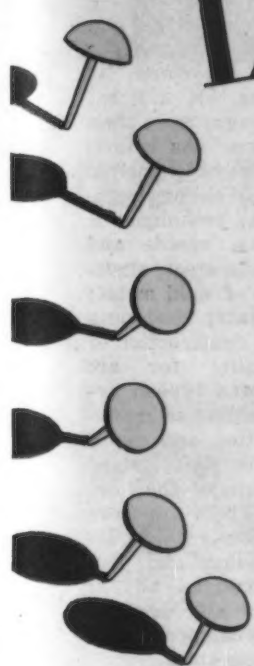
Chromium lowers the solubility to about 1.1 per cent carbon with 10 per cent chromium and to about 0.8 per cent carbon with 20 per cent chromium.

A definition for alloyed steels and cast irons which is based on carbon content must consequently take into account the above lowering by alloying elements of the 1.7 per cent carbon content of the dividing composition. This is, however, not always done, as indicated in the following letter by the author to *Metallurgist* of January, 1932:

Definition of Dividing Line

"At the present time there are no accepted definitions which can be utilized to decide upon the dividing line between steels and cast irons in cases where appreciable quantities of elements, such as silicon and nickel, are present. In the case of low-silicon, unalloyed steels and cast irons, it is generally agreed that steels lie in the range of carbon contents between 0 per cent and 1.7 per cent carbon, while cast irons lie in the range above 1.7 per cent carbon. Unfortunately, however, this figure of 1.7 per cent carbon is apt to be applied by persons without the necessary metallurgical knowledge, to all compositions of cast iron and steel. Difficulties have arisen, for example, in taking out patents, on account of patent office officials in certain countries arguing that all ferrous alloys containing less carbon than 1.7 per cent were steels. This is, of course, incorrect since, as the silicon content increases, the liquid and solid solubility of carbon in iron progressively decreases. For example, the eutectic carbon

(CONTINUED ON PAGE 112)



Let's get down to Brass Tacks about F.H.A. Modernization Credit

You have read in the newspapers about F. H. A. Modernization Credit. It is time now to do something about it.

You may now plan a comprehensive plant modernization and improvement program and spread the payments over a period of years.

Under the terms of the National Housing Act, as amended recently, up to \$50,000 may be financed at a rate of 5% discount on 12 equal monthly instalments, with a maximum of 5 years to pay.

This constitutes the lowest rate and most attractive conditions ever made

generally available for this type of financing.

Here is your opportunity to bring your plant and your equipment into line with that of any new plant; your opportunity to step up operating efficiency; to effect important savings—without impairing working capital. Your program may be one which will pay its own way from the start.

So let's get down to brass tacks. If you are interested in discussing modernization of your equipment on F. H. A. credit, act now while it is available. Write us fully—or send this memo now.

Here are just a few things for which Modernization Credit may be had:

MACHINERY & EQUIPMENT

incl. machine tools
pattern-making machines
welding machinery
grinders
boilers, furnaces
electric hoists
traveling cranes
conveyors, etc.

PLANT EQUIPMENT

incl. heating plants
air conditioning
sprinkler systems
elevators
engines
office equipment, etc.

and many others

Memo to

EQUIPMENT ACCEPTANCE CORPORATION

A Unit of COMMERCIAL INVESTMENT TRUST CORPORATION
1 Park Avenue, New York City

CAPITAL AND SURPLUS OVER \$100,000,000



Without of course obligating myself in any way, I am interested in considering taking advantage of F. H. A. Modernization Credit to purchase the following equipment:

DESCRIPTION AND MAKE OF EQUIPMENT	ESTIMATED COST

FIRM NAME _____

ADDRESS _____

REPLY TO _____

A MURCHEY— To Save Your Tapping Expense!



SIZES:
1 1/4" to 12"

If you are using solid taps you have a profitable opportunity to reduce your tapping costs with the new Murchey Collapsible Tap.

You can perhaps visualize the time saved by this tap over your solid taps, and the following features assure you of high production free from tap troubles:

1. Chasers move in hardened slots.

2. Chasers collapse positively by cam and rollers.

3. Chasers quickly removed for grinding and quickly reset without removing cap.

4. Tap can be used for stationary and rotating tapping.

Let us tell you what Murchey Collapsible Taps are doing in other plants.

MURCHEY MACHINE & TOOL CO.,

951 Porter St.
Detroit, Mich.

(CONTINUED FROM PAGE 110)

content falls progressively from 4.3 per cent carbon with 0 per cent silicon to about 1.8 per cent carbon with 10 per cent silicon. Similarly, the maximum solid solubility of carbide in iron is 1.7 per cent with 0 per cent silicon, but the maximum solubility of graphite has fallen to 0 per cent with 10 per cent silicon. Other elements, such as phosphorus, nickel, aluminum and copper, lower the liquid and solid solubility of carbon in iron in a similar manner. For example, with 10 per cent nickel, the eutectic carbon content is about 3.9 per cent and with 20 per cent nickel about 3.6 per cent. The effect of silicon in lowering the liquid solubility of carbon in iron may be illustrated by the fact that 12 per cent ferrosilicon as made in the blast furnace, or as remelted in the cupola, tends to contain about the eutectic carbon content of 1.5 per cent carbon, but is obviously a cast iron rather than a steel. In order to define the dividing line between steels and cast iron, as the silicon content increases it is suggested that it is most convenient to use the 1.7 per cent carbon with 0 per cent silicon division as a basis. This 1.7 per cent carbon figure represents the maximum solid solubility of carbide in iron containing 0 per cent silicon. Irons having carbon contents in excess

of 1.7 per cent contain eutectic in the as-cast condition. Consequently, on this basis, the definition would be that cast irons are those iron-carbon alloys which contain carbide eutectic, or graphite eutectic, in the as-cast condition, while steels are those which do not contain such eutectic.

"The definition of the dividing line in terms of actual carbon contents for various silicon contents, etc., would be more convenient in many cases, but the necessary solid solubility figures are not available. Moreover, it is not possible to give, for any silicon content, a definite figure for the carbon content at which eutectic first appears in the structure, since such a figure varies according to the manner in which the iron has been melted, e.g., superheated—and according to the rate at which it has been solidified."

Definitions in terms of structure consequently appear to be the most exact (by microscopic examination) and such definitions are not impracticable, since all except borderline cases can be decided in terms of solid solubility composition figures of the type given above. The suggested definitions given at the beginning of this article are consequently in terms of structure and also specify that steels are iron-carbon alloys, to exclude pure iron and wrought iron.

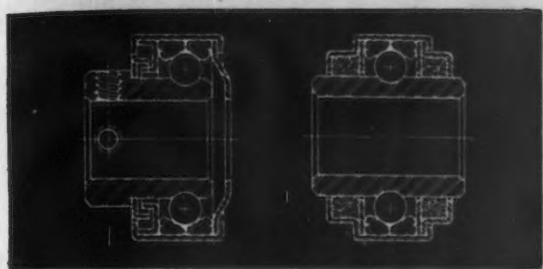
New Handbook on Arc Welding

A REVISED and enlarged edition of its "Procedure Handbook of Arc Welding Design and Practice" is being published by the Lincoln Electric Co., Cleveland. It comprises 586 pages, 5 3/4 x 9 in., which is some 140 pages more than the preceding edition. As before, it is divided into eight principal sections covering: Welding methods and equipment; technique of welding; procedures, speeds and costs for welding mild steel; structure and properties of weld metal; weldability of metals; designing for arc-welded steel construction of machinery; designing for arc welded structures; and typical applications of arc welding in manufacturing, construction and maintenance. The three last named account for two-thirds of the total number of pages. There are more than 700 illustrations, which include detailed drawings and photographic reproductions, all of which are of a size and distinctness that facilitates comprehension of the text they illustrate.

New features of this excellent handbook, which is intended for designers and engineers, as well as for welding supervisors and operators, include American Welding Society specifications for filler metal; method of determining amount of current carried by the electrode; and procedures, speeds and costs for making all types of welds in sheet metals. Also, A.S.M.E. boiler code requirements for butt welds in heavy plate; hard facing for ferrous metals; examples of redesigning for arc welding; use of arc welding in making and repairing cutting tools and dies; and speed of welding oil and gas pipe lines. As in the previous editions, the section dealing with typical applications of arc welding in manufacturing, construction and maintenance is imposing for the variety of applications covered.

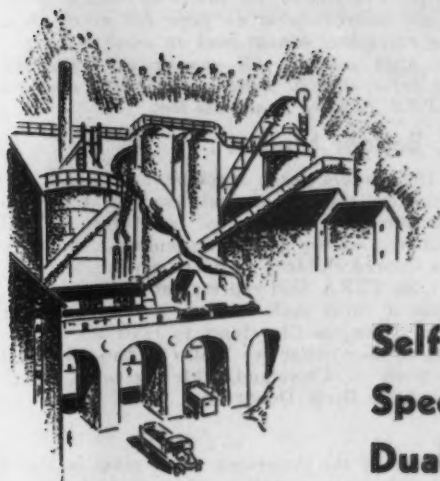
The handbook is bound in semi-flexible simulated leather. The price is \$1.50, foreign postage 50c. extra.

For lighting the upper deck of the San Francisco-Oakland bridge, the Union Metal Mfg. Co., Canton, Ohio, will supply 500 specially designed octagonal-shaped 8-gage steel lighting poles. The new sodium-vapor system of lighting will be used, which is claimed to produce a light that has unusual ability to penetrate a fog. There will be 925 lights in all, the remainder being on the lower deck. This, it is stated, will be the largest sodium-lighting installation in the world.



EVERY TYPE OF BALL BEARING

• FOR EVERY TYPE OF INSTALLATION



**Self-Contained
Speeds up to 2500 R.P.M.
Dual Thrust Capacity**

"COMMERCIAL" ANNULAR BALL BEARINGS successfully meet every ball bearing requirement . . . price, efficiency and economical operation. These bearings are used in hundreds of different industries and products.

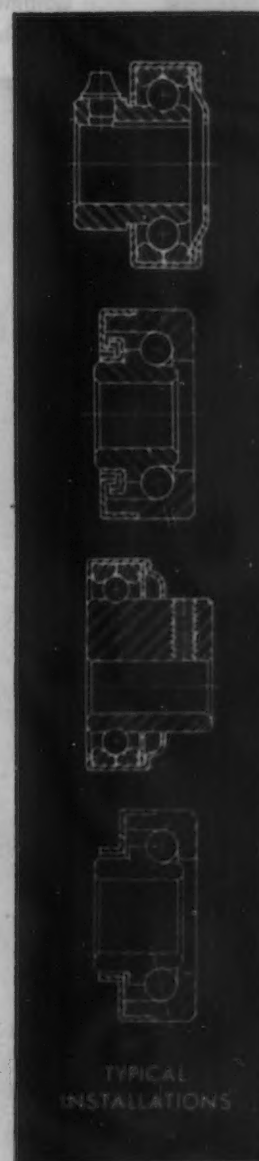
Standard sizes or made to B.P. specifications. If you use ball bearings in your plant or product, let us save you money by giving you further information regarding "COMMERCIAL" Annular Ball Bearings.

**THE SCHATZ MANUFACTURING CO.
POUGHKEEPSIE, N. Y.**

Detroit Sales Office: 2608 Book Tower

Chicago Sales Office: 120 N. Peoria St.

"Commercial"
ANNULAR BALL BEARINGS



NEVERSLIP

ATTENTION

All of the important advantages claimed in some recent Floor Plate advertisements have been inherent in "NEVERSLIP" FLOOR PLATE ever since its introduction over 35 years ago.

Ask for full details and sample of Neverslip Plate.

NOTE: Diamonds shown are actual size.

AMERICAN PRESSED STEEL CO.
Commercial Trust Bldg.
Philadelphia, Pa.

JUST BETWEEN US TWO

Bouquet-Tossing

OCCASIONALLY we toss a bouquet at an advertisement whose beauty or uniqueness catches our eye. We do this timidly, realizing that some of the most effective advertisements are neither beautiful nor unique.

The advertisement that wins the blue ribbon at the advertising exhibit may be a dud as far as influencing the men at whom it is aimed is concerned. Its plainer sister, undazzling to the uninitiate, may be as heavily charged with selling power as Loretta Young is with sex appeal.

Judging the effectiveness of a given advertisement is difficult even when you have all the facts, and futile otherwise.

Inquiries Rolled In

PEAKING of effective advertising, Ed Shultz of Pratt & Whitney tells us that the advertisement on page 146 of the Sept. 26 Iron Age, offering executives a new book on small tools, produced 248 inquiries, with returns still coming in. And this despite the fact that before the 20-word ad appeared the book had been mailed to P&W's entire small tool list.

Doctor, Lawyer, Beggar Man . . .

WHILE 99 out of 100 visitors to the Machine Tool Show were men in the industry, the mechanical marvels proved a magnet for not a few outsiders. The list of registrants included farmers, bankers, ministers of the gospel, agricultural engineers, a chief engineer of a colored children's orphan asylum, a mayor, a street commissioner, an FERA field representative.

Charles E. Sartarin, a rural mail carrier, journeyed all the way from White Pine, Tenn., to Cleveland, to feast his eyes on the tool makers' magic. But what we want to know is what attracted Mr. Jack Stern of Cleveland. Mr. Stern is, of all things, master baker of the Dunk Donut Co.

For Shame!

THE standard of purity of the American trade press is higher than that of its English contemporaries. As proof of that we print this story from the *Foundry Trade Journal*:

Overheard in the lounge of the Metro Ritz on the occasion of the International Foundry Exhibition:

A. "Good heavens, old man, there's my wife and mistress coming in together."

B. "My goodness, you took the very words out of my mouth."

We Get the Bird

OF course, the busy pigeon mentioned here on Oct. 24 flew 25 miles. A.D.W., a pigeon fancier, asks how the bird made a non-skid turn. This was a highly trained bird. What he lost on the turn he made up on the kick-off, like a crack tank swimmer.

Ace

THE Oct. 24 editorial, "In Buying Security, Who Pays for What?" is breaking all records in reader response. Orders for reprints are coming in by mail, wire and long distance. It was a bell-ringer.

More Trouble

GENERAL ELECTRIC'S Guy Bartlett submits this hair thinner: Consider the earth as perfectly spherical, with a diameter of exactly 7,926 miles 1,081 feet 3 inches. It is desired to string a wire around the equator, exactly 6 inches above the surface all the way. How much longer will the wire be than is the circumference of the equator. Use 3.14159265 as pi in all calculations, but don't let that worry you too much.

Not So Dumb

WE get the impression from Seabrook's "Asylum" that it is a mistake to be sorry for all who are insane. Some enjoy the vacation from the realities and actually pity those who must go to the trouble of acting or writing coherently all the time.

Take, for example, the New England gentleman who writes:

*All Canada . . . 10 cats . . . the quickest small office . . .
10 cats . . . well I hope over \$700 . . . put a bell on desk
. . . now blame it . . . did it move . . . Yes . . . does air
brake work . . . well that is why it was patented . . . as good
look . . . air from tube . . . patented June 8, 1920 . . . 10
cats . . . a pat. office . . . I am hear . . . wake up now
. . . over \$2,000,000.*

The dreary restraints of continuity don't hamper him. It must be a genuine enjoyment to write like that. You just put down whatever pops into your head. And if you do it badly enough, you get paid for it, like Gertrude Stein.—A.H.D.